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ABSTRACT

This packet contains two units of informational materials and transparency masters, with accompanying scripts, for teachers to use in an animal science course in vocational agriculture. Unit A on breeds and selection of livestock and poultry includes 13 topics covering beef cattle, dairy cattle, swine, horses, goats, sheep, and poultry. Unit B on handling livestock includes these six topics: handling and restraint of animals; castrating livestock; dehorning; branding, marking, ear notching, tagging and tattooing; docking sheep; and injection procedures. Each section contains information sheets, script for transparencies, references, and transparency masters. A glossary of terms completes the packet. (KC)

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V.A. I ANIMAL SCIENCE

TECHNICAL INFORMATION

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TEXAS A&M UNIVERSITY

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Vocational Instructional Services
Agricultural Education

II-A-I
Basic V.A.I
Agdex .30/30 x 420/32

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock

Topic 1: Breeds of Beef Cattle

*Terms: All terms underlined are included in the "Glossary of Terms"

Note: A slide set, "Breeds of Beef Cattle," is available from Vocational Instructional Services. Also a slide set, "Standard and Exotic Breeds of Beef Cattle," is available.

I. Importance of the Breed

Beef production is one of the largest agricultural industries in the United States. In 1972, there were approximately 118 million beef cattle in the United States with about 8½ million head in Texas, which is the leading state. The beef cattle industry includes three systems of production, (1) feeder cattle production, (2) slaughter cattle production, and (3) breeder cattle production. The primary purpose of the beef cattle industry is the production of meat for human consumption, although hides and other by-products are of economic importance.

The cow-calf program for the production of feeder cattle is the very foundation of beef cattle production in the United States. The producers of feeder cattle are generally those farmers and ranchers who maintain a commercial herd of beef cattle. The calves are generally born in the spring and run on pasture with the cows during the grass season until weaning time at approximately six months of age. Some calves are creep fed to supplement growth while nursing. In some areas, the calves are held after weaning and wintered on winter forages or hay and supplement feed and sold as yearlings. About 97% of the beef cattle in the United States are of commercial breeding; however, most commercial calves are sired by purebred bulls.

Transparency No. 1

Commercial cattle feeding in the U. S. has become a rapidly expanding and highly specialized sector of the agricultural industry. The modern commercial cattle feeding firm is represented by large and highly mechanized feedlot operations. Today, about 2,100 "large" feedlots (1,000 head capacity or more) account for 62% of the nation's total output of fed cattle. The balance of the slaughter cattle are fed out in farmer-feeder type feedlots of a smaller capacity (under 1,000 head).

Transparency No. 2

In Texas, the capacity of the 230 "large" feedlots, with 1,000 plus head in size, totaled 2,915,100 head while the "small" feedlots accounted for 50,000 head. During the calendar year 1972, Texas led the nation in fed cattle marketing with 4.3 million head.

Cattle breeders who maintain purebred herds do so mainly for the production of breeder cattle. Purebreds denote a group of animals having a common origin and possessing certain distinctive characteristics which are transmitted with reasonable uniformity from parent to offspring. These purebreds generally represent a breed. Purebreds are a small but important minority. They have been the major factor in the beef improvement of the past and will continue to exert a powerful influence in the future. Competition among the various breeds of purebred cattle has forced breeder producers to use the most highly scientific methods for breed improvement. The production of purebred cattle is a specialized system of production. The purebred breeder has the responsibility of furnishing foundation stock or replacement stock to other purebred breeders as well as to provide purebred bulls for the commercial producer. Also, hybrid vigor derived from sound crossbreeding programs has placed an even greater demand on breeder producers to provide F_1 females for use in commercial breeding programs.

With this background information on the various facets of the beef cattle industry, we are now ready to examine more closely the identifying characteristics of the various beef breeds. These breeds may be categorized in two groups, standard breeds and exotic breeds. Breeds may be developed as the result of planned matings or due to chance. Once the breed has evolved, a breed association is usually organized.

STANDARD BREEDS (Imported)

ANGUS
BRAHMAN
BROWN SWISS (Beef)
CHAROLAIS
DEVON
GALLOWAY
HEREFORD
MILKING SHORTHORN
RED ANGUS
RED POLL
SCOTCH HIGHLAND
SHORTHORN

BREEDS OF AMERICAN ORIGIN

BARZONA
BEEFMASTER
BRANGUS
CHARBRAY
POLLED HEREFORD
POLLED SHORTHORN
RED BRANGUS
SANTA GERTRUDIS

CROSSBREEDS

(Resulting from first cross of any two of the purebred breeds)

EXOTIC BREEDS (Imported)

BLOND D'AQUITAINE
CHIANINA
GELBVIEH
HAYS CONVERTER
LIMOUSIN
LINCOLN RED
MAINE-ANJOU
MARCHIGIANA
MURRAY GREY
PIEDMONT
PINZGAUER
SIMMENTAL
SUSSEX
WELSH BLACK

II. STANDARD BREEDS (Imported)

BREED	ORIGIN	CHARACTERISTICS
Angus	A. Origin is speculative, some claim they originated from a horned breed in Scotland; others claim they sprang from polled cattle of Britain. B. Native home is Northeastern Scotland C. The first importation was a cow in 1850 from Scotland. D. George Grant imported three bulls in 1873 for use on commercial cattle. E. First herd was imported to Canada in 1876	1. Color.....Black, but small amounts of white on the underline behind the navel is permissible. 2. Polled 3. Size.....a. Compact, closely built, smooth but muscled b. Average Mature Weight (1) Male: 1000-1400 lbs. (2) Female: 750-900 lbs. 4. Sexual Maturity..a. Male: 7-10 months b. Female: 6-9 months 5. Temperament... Nervous in nature but generally easily gentled 6. Production.....a. Breeding Performance (1) Easily adapted to hot and cold climates (2) Good mothering ability (3) Highly prolific (4) High percent birth rate (5) Low to average birth weight (6) Average milkers (7) Average growth weight (8) High % weaning rate b. Feeding Performance (1) Average to high feed conversion (2) Average to high daily weight gain (growth rate) (3) Average to high live grade c. Slaughter Performance (1) High carcass grade (2) Average dressing % (3) Average to high % of high priced cuts (4) High % of marbling (5) High tenderness (low shear force)

BREED	ORIGIN	CHARACTERISTICS	
Brahman	A. Originated in India	1. Color.....	White to dark gray with black humps, necks, and lower legs, light to dark red, gray or red with white, red, or brown spots, brown and black with white spots
		2. Horned.....	With large hump over shoulders, abundance of loose skin under neck and dewlap
		3. Size.....	a. Large, long legs, slender bodies, heavily muscled b. Average Mature Weight: (1) Male: 1400-2000 lbs. (2) Female: 1000-1250 lbs.
		4. Sexual Maturity.....	a. Male: 12-15 months b. Female: 11-13 months
		5. Temperament.....	Extremely docile if quietly handled, but highly nervous if mishandled
		6. Production.....	a. Breeding Performance (1) Adapted to hot dry climate (2) Average mothering ability (3) Average prolificacy (4) Average birth rate (5) High birth weight (6) Good milkers (7) High growth rate (8) Average % weaning rate b. Feeding Performance (1) Average to high feed conversion (2) High daily rate of gain (3) Low to average live grade c. Slaughter Performance (1) Average to high carcass grade (2) Average dressing % (3) High % high priced cuts (4) Low marbling (5) Low tenderness (high shear force)

BREED	ORIGIN	CHARACTERISTICS
Brown Swiss (Beef)	A. The native home of the Brown Swiss breed is Switzerland.	1. Color..... Brown, although the shade may vary from light brown carrying a silvery cast to an extremely dark brown
	B. Most of the early improvement of the breed occurred in the canton (state) of Schwyzer.	2. Horned
	C. The first Brown Swiss cattle were brought to the United States by Henry M. Clark of Massachusetts in 1869.	3. Size..... a. Brown Swiss are one of the largest and most heavily muscled of all dairy breeds b. Average mature weight: (1) Male: 2000-2500 lbs. (2) Female: 1400-1600 lbs.
		4. Brown Swiss are rather slow maturing.
	D. The development of the breed has come primarily from farmer-producer breeders.	5. Temperament.....Usually quiet, docile, and easily managed
		6. Production..... The Brown Swiss is often referred to as the "American Exotic." a. Noted for ruggedness and strong constitution b. Calves weigh 90-100 lbs. at birth and make good vealers. c. Steers have been found to gain 10 to 15% faster than other beef steers fed to the same age. d. Carcasses have less finish, but the quality is very satisfactory. e. Excellent mothering ability with high milk production f. Crossbreeding value for greater size and thriftiness

BREED	ORIGIN	CHARACTERISTICS	
Charolais	A. Originated in the province of Charolles in central France	1. Color.....	White to cream; animals with black noses, spotted, or excessively dark colored pigmentation are disqualified.
		2. Horned	
		3. Size.....	a. Large, heavily muscled, upstanding b. Average Mature Weight: (1) Male: 1500-2000 lbs. (2) Female: 1100-1400 lbs.
		4. Sexual Maturity...	a. Male: 10-13 months Female: 9-12 months
		5. Temperament.....	Docile, easily handled, good natured
		6. Production.....	a. Breeding Performance (1) Adapted to cool and warm climates (2) Average to high mothering ability (3) Average prolificacy (4) Average birth rate (5) High birth weight (6) Good milkers (7) High growth rate (8) Average % weaning weight b. Feeding Performance (1) Average to high feed conversion (2) High daily rate of gain (3) Average live grade c. Slaughter Performance (1) Average carcass grade (2) High dressing % (3) High % high priced cuts (4) Low % marbling (5) Low to average tenderness (high shear force)

BREED	ORIGIN	CHARACTERISTICS	
Devon	A. Originated in Devon County, England	1. Color.....	Red—ranging from a pale chestnut to a rich, deep red. Commonly known as "Red Rubies."
	B. First brought to the U. S. by the colonists early in the seventeenth century	2. Horned.....	Creamy white with black tips
	C. Originally thought of as a dual-purpose breed, but for the past 25 years have been directed primarily to beef production	3. Size.....	Cattle are smaller than the traditional beef breeds and show more refinement in their conformation and bone.
		4. Production.....	a. Cows are considered as good milkers b. Cattle placed in fattening lot produce high quality beef
Galloway	A. Originated in the southwestern district of Galloway in Scotland	1. Color.....	Black; however, a brownish or reddish tint frequently occurs; also characterized by long, curly hair with a mossy undercoat
	B. Earliest importation to the U.S. was made in 1853	2. Polled	
		3. Size.....	Smaller in body size than other beef breeds
		4. Production.....	a. Good rustlers and extremely hardy under cold weather conditions b. Reputation as easy keepers and good gainers c. Produce meat of high quality

BREED	ORIGIN	CHARACTERISTICS	
Hereford	A. Originated in Hereford County, England B. First imported to U.S. in 1817 to Kentucky by Henry Clay	1. Color.....	Red bodies ranging from light to deep red. White faces, underline, flank, crest, switch, breast, and below knees and back. Red neck or white extending behind withers on back, too high in flanks or above knees and backs is objectionable.
		2. Horned	
		3. Size.....	a. Upstanding, large bones, muscled b. Average mature weight: (1) Male: 1200-1800 lbs. (2) Female: 800-1000 lbs.
		4. Sexual Maturity.....	a. Male: 9-13 months b. Female: 8-12 months
		5. Temperament.....	Very docile, easily handled and gentled
		6. Production.....	a. Breeding Performance (1) Easily adapted to hot or cold climates (2) Good mothering ability (3) Highly prolific (bulls and cows) (4) High percentage birth rate (5) Average birth weight (6) Low to average milkers (7) Average growth rate (8) High percent weaning b. Feeding Performance (1) High feed conversion (2) High daily rate of gain (growth rate) (3) High live grade

Hereford (continued)

BREED	ORIGIN	CHARACTERISTICS
		c. Slaughter Performance (1) High carcass grade (2) Average to high dressing percent (3) Average to high percent high priced cuts (4) High percent marbling (5) High tenderness (low shear force)
Milking Shorthorn	A. Developed by Thomas Bates in England	1. Color..... Roan, other combinations of red and white
	B. Bred for a dual-purpose type	2. Originally horned, but polled strains have been developed.
	C. American farmers began developing herds as early as 1885.	3. Size..... a. Cattle tend to be of a larger frame and higher off the ground than common beef type b. Mature Weights: (1) Male: 2000-2500 lbs. (2) Female: 1400-1800 lbs.
		4. Temperament..... Inclined to be slightly nervous and flighty
		5. Production..... a. Cows show good mammary development. b. Very competitive in beef producing qualities c. Variation in type presents a problem in the showring

BREED	ORIGIN	CHARACTERISTICS
Red Angus	A. The origin of the breed was in the British Isles, the same as the Black Angus.	1. Color . . . . . Red Angus are homozygous for the red color and always breed true when mated to each other.
	B. In England and Scotland both blacks and reds are registered in the same association without distinction.	2. Polled 3. The general characteristics are similar to those of the black cattle. 4. All animals must pass inspection before registration.
	C. The Red Angus Association of America was organized in 1954.	5. The breed maintains a high percentage of its cattle on production testing.
	D. In the U. S., red colored animals have been barred from registry in the American Angus Association.	
Red Poll	A. Originated in England prior to 1800	1. Color . . . . . Red; varying from light to dark red
	B. First imported by F. G. Faber in New York in 1873	2. Polled. . . . . When bred to horned cattle have proven to be 95% to 100% dehorner
	C. Developed as a dual-purpose breed in their native counties	3. Size . . . . . a. Medium sized breed b. Mature Weight (1) Males: 1900-2200 lbs. (2) Females: 1200-1700 lbs.
		4. Production . . . . a. Cows give an abundance of rich milk which produces high-quality beef-type calves. b. Calves meet requirements of the fat slaughter calf market or the feedlot. c. Cattle have reputation of producing high cutability carcasses.

Red Poll (continued)

BREED	ORIGIN	CHARACTERISTICS
		d. Cattle do quite well under less than favorable grazing conditions. e. Remarkably uniform in type and quality
Scotch Highland	A. Scotland B. First importation to the U.S. in 1883	1. Color.....Silver, golden, light red, brindle, black, or dun 2. Long, widespread horns and heavy foretop 3. Distinctive appearance with long, shaggy coats of hair 4. Able to withstand severe climates 5. Cattle exhibit a very nervous temperament under most conditions.

BREED	ORIGIN	CHARACTERISTICS	
Shorthorn	A. Originated in northeastern England B. First beef breed imported to America by Miller and Gough of Virginia in 1783	1. Color	Red, white, and roan; combinations of red and white; nose flesh colored
		2. Horned and polled	
		3. Size	a. Smooth, upstanding medium muscled b. Average Mature Weight: (1) Male: 1400-1700 lbs. (2) Female: 900-1200 lbs.
		4. Sexual Maturity	a. Male: 9-13 months b. Female: 8-12 months
		5. Temperament	Good disposition, easily handled
		6. Production	a. Breeding Performance (1) Adapted to cold and warm climates (2) High mothering ability (3) Highly prolific (4) High birth rate (5) Average birth weight (6) Good milkers (7) High growth rate (8) High % weaning rate b. Feeding Performance (1) Average to high feed conversion (2) Average daily rate of gain (3) Average to high live grade c. Slaughter Performance (1) Average to high carcass grade (2) Average dressing % (3) Average % high cuts of meat (4) High % marbling (5) High tenderness (low shear force)

BREEDS OF AMERICAN ORIGIN

BREED	ORIGIN	CHARACTERISTICS
Barzona	A. Developed at the Bard Kirkland Ranch in Arizona	1. Color..... Red
		2. Horned
	B. Name of breed comes from a combination of Bard and Arizona	3. Size..... Big, rugged cattle resulting from the crossing of Africander, Hereford, Angus, and Santa Gertrudis breeds
		4. Developed in an effort to produce an animal adapted to the harsh, arid conditions of the southwestern United States
		5. Cattle exhibit loose skin characteristic typical of hybrid Africander breeding.
Beefmaster	A. Developed by the Lasater Ranch formerly of Falfurrias, Texas and now of Colorado	1. Color..... Red is the dominant color, is variable, and is disregarded in selection.
	B. Established by Ed Lasater in 1908	2. Majority of cattle are horned, although a few are naturally polled.
		3. Size..... Mature cattle are large in size.
	C. Percentage blood of parent breeds of the Beefmaster runs about 25% Hereford, 25% Shorthorn, and 50% Brahman	4. Production..... a. Cows are good producers under range conditions.
		b. Weaning weights are used as a criterion for selecting heifers and bulls for replacements.
	D. Unique breed in that each breeder affixes his name to his own strain of cattle, such as "Lasater Beefmasters"	c. Good performance in feedlots has been achieved
		d. Conformation is not considered important except as it relates to the production of red meat.

BREED	ORIGIN	CHARACTERISTICS
Brangus	A. Developed on the Clear Creek Ranch in Welch, Oklahoma B. Crossings of Angus and Brahman cattle started in 1932. C. Registration requirements call for an animal of 5/8 Angus and 3/8 Brahman breeding. D. Breed association was formed in 1949	1. Color..... Black 2. Polled 3. Size..... Among the larger of the beef breeds 4. Characterized by a slight crest over the neck with a smooth, sleek hair coat. 5. Cattle are known to produce a high quality carcass. 6. Well adapted to the southwestern regions of the United States
Charbray	A. Originated in the Rio Grande Valley in Texas B. The result of blending the Charolais and the Brahman breeds C. Cattle must have at least 1/16 and not more than 1/4 Brahman to be eligible for registration.	1. Color..... Golden to white 2. Horned 3. Size..... a. A large very rugged breed b. Mature Weights: (1) Male: 2500-3200 lbs. (2) Female: 1700-2200 lbs. 4. The hump of the Brahman is almost nonexistent, but evidence of a heavy dewlap remains. 5. Cows milk well and produce heavy weaning calves. 6. Cattle exhibit heavy muscling in the loin and quarters.

BREED	ORIGIN	CHARACTERISTICS	
Polled Hereford	A. Originated by Warren Gammon of Iowa in 1902 B. Gammon purchased 11 polled mutations from various breeders from which the Polled Hereford was developed.	1. Color	Red bodies ranging from light to deep red. White faces, underline, flank, crest, switch, breast, and below knees and backs. Red necks or white extending behind withers on back, too high in flanks, or above knees and backs is objectionable.
		2. Polled	Presence of horns or scurs is objectionable.
		3. Size	a. Upstanding, a little more compact than horned Herefords, muscles sometimes lighter in hind quarters than Hereford. b. Mature Weight: (1) Male: 1100-1600 lbs. (2) Female: 800-900 lbs.
		4. Sexual Maturity	a. Male: 9-13 months b. Female: 9-12 months
		5. Temperament	Very docile, easily handled and gentled
		6. Production	a. Breeding Performance (1) Easily adapted to hot or cold climates (2) Good mothering ability (3) Highly prolific (bulls and cows) (4) High percentage birth rate (5) Average birth weight (6) Low to average milkers (7) Average growth rate (8) High % weaning rate

Polled Hereford (continued)

b. Feeding Performance
   (1) Average to high feed conversion
   (2) Average daily rate of gain (growth rate)
   (3) Average to high live grade
c. Slaughter Performance
   (1) Average carcass grade
   (2) Average to high dressing percent
   (3) Average to high percent of high priced cuts
   (4) High percent marbling
   (5) High tenderness (low shear force)

BREED	ORIGIN	CHARACTERISTICS
Polled Shorthorn	A. Developed in the north central states of the U. S., chiefly Ohio and Indiana	1. Color . . . . . Red, white, or any combination of red and white (roan)
		2. Polled. . . . . A dominant characteristic
	B. First referred to as Polled Durhams, but officially named Polled Shorthorns in 1919.	3. Other characteristics are similar to the Shorthorn breed.
		4. Pedigrees also very similar to the horned Shorthorns.
Red Brangus	A. Developed in the U. S. in 1946 on the Paleface Ranch at Spicewood, TX	1. Color . . . . . Red
		2. Polled
	B. Results from crossing the Angus and Brahman breeds, but there are no requirements for any specific percentage for registration.	3. Similar to the Brangus in other body characteristics
		4. Recognized for growth rate, efficiency of production, and carcass quality
		5. A desirable beef breed

BREED	ORIGIN	CHARACTERISTICS	
Santa Gertrudis	A. Developed by the King Ranch, Kingsville, Texas	1. Color	Red or cherry red; white or other spotting, fawn, cream or brindle color, black skin are disqualifications.
	B. Developed from crossing Brahman and Shorthorn cows; started in 1910	2. Horned	Neck folds and sheath present
	C. Breed is 5/8 Shorthorn and 3/8 Brahman	3. Size	a. Large, loose hided, big bones, beef type b. Average Mature Weight: (1) Male: 1500-2000 lbs. (2) Female: 1000-1300 lbs.
	D. Breed name is derived from the Santa Gertrudis Land Grant by Spain which is now the headquarters division of the King Ranch	4. Sexual Maturity	a. Male: 12-15 months b. Female: 11-13 months
		5. Temperament	Active, not generally nervous, gentle natured when handled quietly
		6. Production	a. Breeding Performance (1) Adapted to warm or hot climates (2) Average mothering ability (3) Average prolificacy (4) Average birth rate (5) High birth weight (6) Good milkers (7) Average to high growth rate (8) Average % weaning rate b. Feeding Performance (1) Average feed conversion (2) Average daily rate of gain (3) Average live grade c. Slaughter Performance (1) Average carcass grade (2) Average dressing %

Santa Gertrudis (continued)

(3) Average % high priced cuts
(4) Low to average % marbling
(5) Low to average tenderness (high shear test)

Crossbreeding:

1. East Texas Farm and Ranch F_1 Registry
   102 East Locust
   Tyler, TX 75701

2. Only certified heifers (those of registered purebred crosses) can be recorded.

The mating of animals of two purebred breeds produces the first cross offspring (F_1). The F_1 females possess hybrid vigor which means they are able to produce better than their parents. Weaknesses of a specific breed tend to be overcome in the use of crossbreeding. In second cross females, those produced by F_1 females, hybrid vigor is evident but reduced.

The use of purebred bulls in any breeding program gives the best results.

F_1 females can be mated to purebred bulls of either parent breed or to purebred bulls of a third breed.

The more distant related the two parent breeds are, the greater the hybrid vigor. Hereford X Angus would be more closely related (English breeds) than Hereford X Brahman (English and Zebu breeds).

The weaker a trait in a breed the greater the improvement through crossbreeding of this trait. A cow of one breed which weans 300 lbs. of beef x a bull which averages 400 lbs. may produce an F_1 cow who will wean 410 lbs. of beef. Whereas, a cow of a different breed which weans 400 lbs. of beef x the bull that averages 400 lbs. of beef weaned may produce an F_1 cow that weans 430 lbs. of beef. The increase is greater in the first case.

Good purebred herds are a necessity in producing F_1 females for crossbreeding programs.

EXOTIC BREEDS (Imported)

BREED	ORIGIN	CHARACTERISTICS
Blond D'Aquitaine	A. Southern France	1. Color ..... Fawn colored, varying from wheaten to slightly red; the hair is short and soft. 2. Horned 3. Size ..... a. Mature Weight: (1) Male: approximately 2500 lbs. (2) Female: approximately 1500 lbs. 4. Formerly valued as a draft animal as well as for meat and milk production 5. Heavily muscled body with a deep chest, wide hips, and well-developed, muscular hindquarters
Chianina	A. Originated in the Chianina Valley in Central Italy B. Said to have been the sacrificial cattle of the ancient Romans	1. Color ..... White 2. Horned 3. Size ..... a. Reputed to be the largest of all beef breeds b. Cattle stand five and a half feet high at the withers c. Mature Weight: (1) Male: 1800-2500 lbs. with some up to 4000 lbs. (2) Female: 1700-2100 lbs. 4. Until recently were used for draft stock as well as for beef

Chianina (Continued)

		5. Conformation ..... a. Structurally, they exhibit excellent uniformity of body depth, trimness of middle, and absence of excessive dewlap and brisket. b. Strong legs and hard hooves have been developed through the centuries of selection for work.

BREED	ORIGIN	CHARACTERISTICS
Gelbvieh	A. Native to Austria and the Bavarian region of West Germany	1. Color ..... Varies from a light tan or yellow to a light red
		2. Horned
	B. Gelbvieh literally means "yellow cattle."	3. Size ..... Mature Weight: (1) Male: 2200-2400 lbs. (2) Female: 1400-1800 lbs.
		4. Cattle have been developed as a tri-purpose animal, for draft as well as for milk and meat.
		5. Excellent beef conformation
Hays Converter	A. Developed in Canada by the former Minister of Agriculture, Senator Harry Hays	1. Color ..... Usually black with a white face, although there are a few red or red with a white face
	B. Foundation stock of Hereford-Brown Swiss hybrids being crossed with Hereford-Holstein hybrids	2. Horned and polled
		3. Developed to produce a fast-growing, good-milking type of cattle, combining desirable traits from beef and dairy herds
	C. A combination of these two F_1 hybrids were interbred to produce.	4. Good rustlers and raise a good calf as a result of their genetic ability for hardiness, growth, and increased milk

BREED	ORIGIN	CHARACTERISTICS
Limousin	A. Originated in south central France B. Developed for draft and beef C. First Limousin bull imported to the North American continent in 1967	1. Color..... Wheat-colored, ranging from reddish to light yellow 2. Predominately horned but there are a few polled cattle. 3. Size..... Mature weight (1) Male: approximately 2400 lbs. (2) Female: approximately 1300 lbs. 4. Excellent body conformation a. Long body with good length of loin b. Hindquarters are heavily muscled and carry well down to the hocks. 5. High growth rate 6. Cows are very productive, fertile, and good milkers.
Lincoln Red	A. Descending from the Shorthorn breed B. Developed as a distinct breed in the Lincolnshire area of England for well over a century	1. Color..... Deep cherry red with medium thick hair 2. Horned, but a large percentage of animals are polled. 3. Size..... Mature Weight: (1) Male: 1800 to 2000 lbs. (2) Female: approximately 1400 lbs. 4. Formerly recognized as a dual-purpose breed but now largely bred for beef 5. Cattle are long-bodied, deep-chested, and well-muscled.

BREED	ORIGIN	CHARACTERISTICS
Maine-Anjou	A. Developed in France B. Resulted from crossing the native Mancelle cattle of Brittany with imported English Shorthorns	1. Color ..... Animals vary from red bodies with white markings to dark roan; a red coat color is favored by most French breeders. 2. Horned 3. Size ..... a. Described as probably bigger than any other French breed b. Mature weight: (1) Male: approximately 2400 lbs. (2) Female: 1400-1600 lbs. 4. Used for meat and milk with emphasis on beef 5. Conformation ..... a. Cattle are long-bodied and rather upstanding with a long rump b. Heavily muscled body of typical beef conformation 6. Average milk production is about 5,000 lbs. per lactation.
Marchigiana	A. Native to the central part of Italy	1. Color ..... Gray 2. Horned 3. Size ..... a. Cattle are large. b. Mature Weight: (1) Male: up to 2650 lbs. (2) Female: 1350-1500 lbs. 4. Formerly used for draft as well as for beef production 5. Considered quite efficient as beef producers 6. Resemble the Chianina in some ways

BREED	ORIGIN	CHARACTERISTICS
Murray Grey	A. Originated in Australia in 1906	1. Color ..... Silver gray with a black pigment in the skin
	B. Developed by crossing an extremely light roan Shorthorn cow with an Aberdeen Angus bull. During her lifetime, the Shorthorn cow had 12 calves, which were all dun gray, from Angus matings. It was from her bull calves that the breed descended.	2. Polled 3. Size ..... Mature Weight: (1) Male: one ton or more (2) Female: 1300-1500 lbs. 4. Much like the Angus in type. 5. Animals produce a very desirable carcass. 6. Reputation for easy calving; calves weigh 60-70 lbs. at birth.
Piedmont	A. Originated in northwestern Italy	1. Color ..... Grayish-white body with darker gray or black about the head, neck, and shoulders, often encircling the eyes; the nose, hooves, and switch are black. 2. Horned 3. Conformation..... a. Double muscling is a selected trait, and it is evident in the bulging hindquarters. b. Results from the Italians selecting and breeding for more red meat. c. Breeders of these cattle claim a carcass cut-out of 75% meat. 4. Fertility and ease of calving are factors relating to the success of the Piedmont in a crossing program.

BREED	ORIGIN	CHARACTERISTICS
Pinzgauer	A. Originated in Australia and the adjacent areas of the Federal Republic of Germany and Italy	1. Color ..... Chestnut brown with a variety of white marks on the back, the rump, and along the underline. 2. Horned 3. A dual-purpose for both meat and milk production 4. Fertility and longevity have been emphasized with fertility reaching about 91%. 5. Conformation ..... a. A long barrel with good width and depth through the chest and hips is desirable. b. Cattle possess a lean but beefy type muscling with thick, wide loins. c. Noted for soundness of feet and legs for excellent ranging ability. 6. Average 305-day milk production about 9,000 lbs. with a 4% fat content. 7. Produces a high quality meat which is light-colored and has a fine grain. 8. Slaughter calves produce excellent weight gains on feed tests.

BREED	ORIGIN	CHARACTERISTICS
Simmental	A. Originated in the Simme Valley of Switzerland B. From there the breed has spread to most of the continents C. The predominant breed in Europe today, numbering over 35 million head D. In France, the cattle are called "Pie Rouge," while in Germany they are called "Fleckvieh."	1. Color ..... Generally red and white spotted, although some are solid in color; a white face appears to be dominant in inheritance (as in the Hereford); red varies from dark to almost yellow in shade. 2. Horned 3. Size ..... Mature Weight: (1) Male: up to 2600 lbs. (2) Female: 1400-1800 lbs. 4. Originally developed for milk, meat, and draft, but now much in demand for beef. 5. Conformation ..... a. Long bodied b. Relatively heavy-boned c. Well muscled 6. Cows are good milkers. 7. In feedlot, comparable to the Charolais in growth.
Sussex	A. Originated in England B. Developed strictly as a beef breed	1. Color ..... Deep cherry red with a white switch 2. Horned ..... Polled factor has been introduced. 3. Size ..... Mature Weight: (1) Male: 2000 lbs. or more (2) Female: approximately 1400 lbs. 4. Conformation ..... a. Long, cylindrical body b. Straight back with well sprung ribs c. Wide loins and broad hindquarters 5. The breed offers maximum hybrid vigor in crossing, with crosses having a better performance than purebreds.

BREED	ORIGIN	CHARACTERISTICS
Welsh Black	A. Recognized as the oldest British breed	1. Color ..... Black with a shaggy winter coat
	B. Reports of these cattle from the hills of Wales as early as 1300	2. Horned
		3. Size ..... Compares with the Devon
	C. A long history of usefulness for draft, milk, and beef production	4. Noted for hardiness
		5. Make good use of sparse grazing
		6. Ability to withstand unfavorable weather conditions

BREED REGISTRY ADDRESSES

Standard Breeds

Angus	American Angus Association 3201 Frederick Boulevard St. Joseph, MO 64501
Brahman	American Brahman Breeders Association 4815 Gulf Freeway Houston, TX 77023
Brown Swiss	Brown Swiss Cattle Breeders Association Box 1038-A Beloit, WI 53511
Charolais	American-International Charolais Association 1606 Old Spanish Trail Houston, TX 77025
Devon	Devon Cattle Association, Inc. P.O. Drawer 628 Uvalde, TX 78801
Galloway	American Galloway Breeders' Association 302 Livestock Exchange Bldg. Denver, CO 80216
Hereford	American Hereford Association Hereford Drive Kansas City, MO 64105
Milking Shorthorn	American Milking Shorthorn Society 313 South Glen Stone Springfield, MO 65802
Red Angus	Red Angus Association of America P.O. Box 776 Denton, TX 76201
Red Poll	Red Poll Cattle Club of America 3275 Holdredge Street Lincoln, NB 68503

Breed Registry Addresses
(Continued)

Scotch Highland	American Scotch Highland Breeders Association Edgemont, SD 57735
Shorthorn	American Shorthorn Association 8288 Hascall Street Omaha, NB 68124

Breeds of American Origin

Barzona	Barzona Breeders Association of America P.O. Box 631 Prescott, AZ 86302
Beefmaster	Beefmaster Breeders Universal 800 N.W. Loop 410, Suite 350 San Antonio, TX 78216
Brangus	International Brangus Breeders Association 908 Livestock Exchange Building Kansas City, MO 64102
Charbray	American Charbray Breeders Association 475 Texas National Bank Building Houston, TX 77002
Polled Hereford	American Polled Hereford Association 4700 E. 63rd Street Kansas City, MO 64130
Polled Shorthorn	American Polled Shorthorn Society Livestock Exchange Building Union Stockyards Omaha, NB 68107
Red Brangus	American Red Brangus Association 404 Colorado Austin, TX 78701
Santa Gertrudis	Santa Gertrudis Breeders International Association P.O. Box 1257 Kingsville, TX 78363

Breed Registry Addresses
(Continued)

Exotic Breeds

Blond D'Aquitaine	Blond D'Aquitaine Society of America P.O. Box 250 Stillwater, MN 55082
Chianina	American Chianina Association P.O. Box 11537 Kansas City, MO 64138
Gelbvieh	American Gelbvieh Association Route 1, Box 126 Newkirk, OK 74647
Hays Converter	Hays Converter c/o Senator Harry Hays Calgary, Alverta, CANADA
Limousin	North American Limousin Foundation 309 Livestock Exchange Building Denver, CO 80216
Lincoln Red	Canadian Lincoln Red Association c/o J.G. Lorriman Box 447 Richmond Hill, Ontario, CANADA
Maine-Anjou	American Maine-Anjou Association 564 Livestock Exchange Bldg. Kansas, City, MO 64102
Marchigiana	Marchigiana (Breed Registry Association not known)
Murray Grey	American Murray Grey Association, Inc. Route 4, Box 179-A Shelbyville, KY 40065
Piedmont	Piedmont (Breed Registry Association not known)

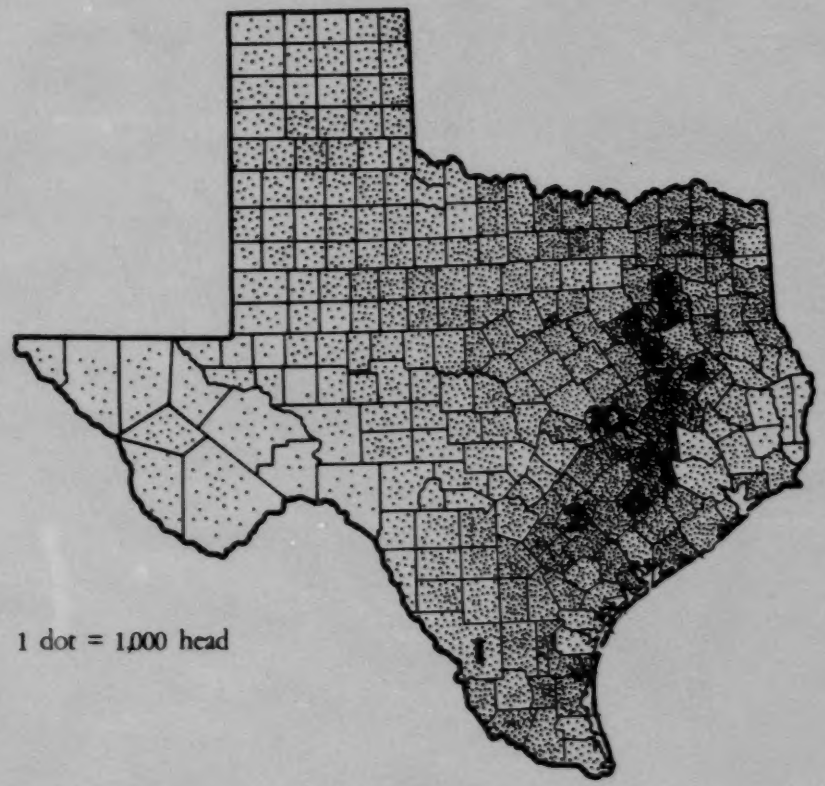
Breed Registry Addresses
(Continued)

Pinzgauer	Pinzgauer Breeders Ltd. Box 600 Picture Butte, Alberta, CANADA
Simmental	American Simmental Association P. O. Box 24 Bozeman, MT 59715
Sussex	Sussex (Breed Registry Association not known)
Welsh Black	Canadian Welsh Black Cattle Society Taber, Alberta, CANADA

REFERENCES:

1. Ensminger, M. E., Beef Cattle Science, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1968.
2. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.
3. Briggs, Hilton M. and Dinus M. Briggs, Modern Breeds of Livestock, The Macmillan Company, Collier-Macmillan Limited, London, England, 1969.
4. Ensminger, M. E., Animal Science, Sixth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.
5. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.
6. Breed Association publications and journals

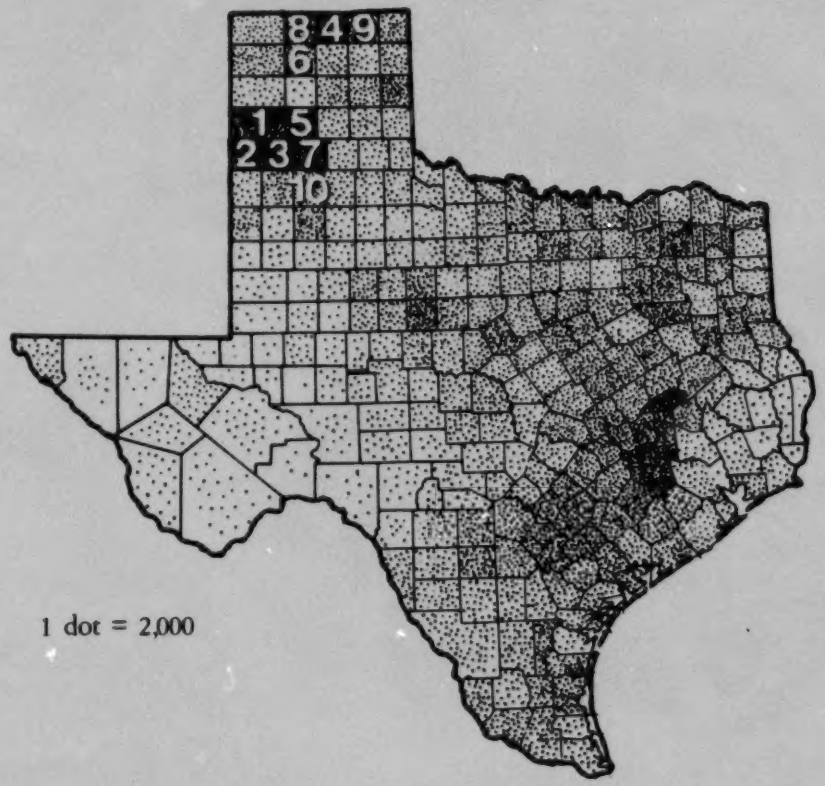
BEEF COWS THAT HAD CALVED
JANUARY 1, 1973



TEN LEADING COUNTIES	1,000 HEAD
1. WEBB	77
2. GONZALES	73
3. NAVARRO	70
4. HOUSTON	67
5. HENDERSON	66
6. COLORADO	64
7. LEON	61
8. FREESTONE	60
VAN ZANDT	60
10. MILAM	59

IN TEXAS 6,320,000

ALL CATTLE
(INCLUDING CATTLE ON FEED)
JANUARY 1, 1973



TEN LEADING COUNTIES	1,000 HEAD
1. DEAF SMITH	426
2. PARMER	251
3. CASTRO	247
4. HANSFORD	239
5. RANDALL	197
6. SWISHER	182
7. SHERMAN	154
8. HALE	144
9. HOPKINS	143
10. WEBB	135

IN TEXAS 15,350,000
TOTAL CATTLE ON FEED

ANIMAL SCIENCE

Unit A: Breeds of Livestock and Poultry

Topic 2: Breeds of Dairy Cattle

*Terms: All terms underlined are included in the "Glossary of Terms."

Note: A slide set, "Breeds of Dairy Cattle," is available from Vocational Instructional Services.

I. Importance of the Breed

The production of dairy products represents a major enterprise within the agricultural economy of this country. The income from the sale of dairy products represents about 13% of the nation's farm income each year. The development of pasturization, refrigeration, homogenization, and methods of milk processing have brought about this advancement. Milk is the most nearly perfect food as it contains most of the nutrients required by humans.

Dairy production has become so scientific and specialized that most operations are no longer diversified. However, in some instances, dairy production does fit into other farm operations. The labor requirements and costs require diversification for efficiency in smaller operations.

The use of highly controlled selection and breeding programs based on performance records has resulted in increased production in dairy cattle. In many areas a trend toward replacement herd purchasing of proven cows and heifers of proven parentage has greatly increased production. A trend toward breeding dairy cattle to beef bulls is increasing as there is a demand for such crosses by commercial beef producers in crossbreeding programs. Many dairymen are using frozen semen from the exotic beef bulls as they are already engaged in artificial breeding programs.

These trends provide for a highly desirable situation as the production of the milking herd is raised and an additional income is provided from the sale of the crossbred calves.

In programs where replacements are raised, artificial breeding provides for the use of the semen of proven dairy sires to all breeders.

There is no one best breed of dairy cattle; however, a certain breed may be better adapted to certain environmental conditions and market demands and, from these standpoints, is better for a particular individual. Each of the breeds has certain advantages, and it is a matter of weighing and comparing the advantages with the disadvantages in selecting a breed.

An important consideration to remember is that there are outstanding cows in every breed, and the difference between breeds may be of lesser importance than the differences of individual animals within the breed. When the breed that is best suited to the production program has been selected, then major emphasis should be placed upon the breeding or selecting of individual cows which will be most productive. The person making the selection should always bear in mind that utility, adaptation, and productive capacity are important qualities to consider in selecting a breed.

The five major breeds of dairy cattle that will be discussed in this topic are the Ayrshire, the Brown Swiss, the Guernsey, the Holstein-Friesian, and the Jersey. Three other dairy breeds that are found in smaller numbers, but which will be discussed, are the Dutch Belted, the Milking Shorthorn, and the Red Danish.

II.

BREED	ORIGIN	CHARACTERISTICS	
A Ayrshire	1. Originated in Scotland	a. Color	Red with white markings or white with red markings with the red ranging from light to very dark
	2. First imported in 1822	b. Horned	Characterized by long horns that turn upward
		c. Size	(1) Fairly large; usually between Guernsey and Holstein (2) Average Mature Weight: (a) Male: 1600-2300 lbs. (b) Female: 1100-1300 lbs. (3) Calves at birth weigh 70 to 80 lbs.
		d. Temperament	Females are active and prove to be nervous; bulls may be vicious.

Ayrshire (Continued)

	e. Production	(1) Milk—average production (2) Butterfat—average around 4%
	f. Considered by many to be the most attractive dairy breed. Animals are noted for straight top lines, level rumps, and good udders.	

BREED	ORIGIN	CHARACTERISTICS	
Brown Swiss	1. Developed in the mountainous areas of Switzerland 2. First imported in 1869 at Belmont, Massachusetts 3. One of the oldest and purest dairy breeds	a. Color	Varies from light fawn to almost black, horn tips and switch are black and stripe along backbone and legs are generally light in color.
		b. Horned	
		c. Size	(1) The largest, most rugged dairy cattle; demonstrate beef characteristics (2) Cattle have large bones, a large head, and thick, loose skins. (3) Average Mature Weight: (a) Male: 1800-2400 lbs. (b) Female: 1200-1400 lbs.
		d. Temperament	Quiet, docile, and easily managed
		e. Production	(1) Milk—average producers being similar to the Ayrshire in lbs. of production (2) Butterfat—average around 4%
		f. Calves at birth weigh from 80-125 lbs. and studies indicate that they gain rapidly and make desirable veal at an early age.	

BREED	ORIGIN	CHARACTERISTICS	
C. Guernsey	1. Island of Guernsey off the coast of France in 1831 2. Often referred to as the "Golden Guernsey" because of the rich yellow color of the milk	a. Color	(1) Varies from a light fawn to red with white markings on face, legs, switch, and flank (2) The nose should be buff or cream colored and the skin yellow.
		b. Horned	
		c. Size	(1) Smaller framed, less rugged than Holstein (2) Average Mature Weight: (a) Male: 1500-1800 lbs. (b) Female: 800-1100 lbs. (3) Calves at birth weigh 65 to 75 lbs.
		d. Temperament	Females are active but not nervous; bulls are generally docile but may be vicious if mishandled.
		e. Production	(1) Milk—high producers but usually not as high as the Holstein (2) Butterfat—averages from about 4.5% to 5% (3) Milk quite often sells at a premium on the market because of its golden color.
D. Holstein-Friesian	1. Originated in Holland and were called Friesians 2. First imported in 1625 3. Bred to produce a large amount of milk	a. Color	Black and white, ranging from white with a few black spots to almost black
		b. Horned	
		c. Size	(1) Large, framed and ruggedly built with large feeding capacities and udders (2) Average Mature Weight: (a) Male: 1700-2000 lbs. (b) Female: 1100-1600 lbs.

Holstein-Friesian (Continued)

(3) Calves at birth weigh 85 to 95 lbs. and are large and vigorous.

d. Temperament..... Females are quiet and docile but bulls may be vicious.

e. Production..... (1) Milk—one of the highest producing breeds in total pounds
(2) Butterfat—low percentage averaging about 3.5% but due to large amount of milk produced, rate high in total butterfat production.

f. A summary of the nation's DHIA records shows that more Holsteins were reported than all other dairy breeds combined.

BREED	ORIGIN	CHARACTERISTICS	
E. Jersey	1. Originated on the Island of Jersey in the English Channel 2. First imported in 1850	a. Color.....	(1) Body varies from light fawn to black and from spotted to solid colored. (2) The switch may be black or white, the muzzle is generally black, and the tongue may be black or white.
		b. Horned	
		c. Size.....	(1) The Jersey is the smallest of the dairy breeds but approaches the true dairy type (2) Average Mature Weight: (a) Male: 1200-1500 lbs. (b) Female: 600-900 lbs. (3) Calves weigh 50 to 60 lbs. at birth.

Jersey (Continued)

d. Temperament..... Females inclined to be nervous and sensitive but are very docile under good management conditions. Bulls are prone to be quite vicious.

e. Production..... (1) Milk—do not produce as large quantity as the larger breeds
(2) Butterfat—averages about 5.3%
(3) Milk sells at a premium because of its superior quality.

f. Good dairy character is reflected in straight top lines, level rumps, and sharp withers.

III. Other Dairy Type Breeds

BREED	ORIGIN	CHARACTERISTICS	
A. Dutch Belted	1. Native to Holland 2. First imported in 1840 as an exhibition feature of the Barnum & Bailey Circus	a. Color.....	Black with white belt encircling the body between the hooks and front legs not less than six inches at the narrowest point
		b. Size.....	(1) Large cattle showing same beef characteristics (2) Average Mature Weight: (a) Male: 1600-2000 lbs. (b) Female: 1100-1300 lbs.
		c. Temperament.....	Docile, easily handled
		d. Production.....	(1) Good profitable milk producers under ordinary conditions (2) Butterfat tests 3.5 to 5.5%

Transparency No. 1

A comparison of some of the common characteristics of the five major dairy breeds is given in table form. These characteristics on which the breeds are compared include mature cow size, milk production, percent butterfat, size of calves at birth, cattle registrations, and butterfat production.

BREED	REGISTRIES & ASSOCIATIONS
Major Breeds	
A. Ayrshire	Ayrshire Breeders Association Brandon, VT 05733
B. Brown Swiss	Brown Swiss Cattle Breeders Association 800 Pleasant Street Beloit, WI 53511
C. Guernsey	American Guernsey Cattle Club 70 Main Street Peterborough, NH 03458
D. Holstein-Friesian	Holstein-Friesian Association of America P. O. Box 808 Battleboro, VT 05301
E. Jersey	American Jersey Cattle Club 2105-J South Hamilton Road Columbus, OH 43227
Other Breeds	
A. Dutch Belted	Dutch Belted Cattle Association of America 4400 W. 12th Avenue Hialeah, FL 33012
B. Milking Shorthorn	American Milking Shorthorn Society 313 S. Glen Stone Springfield, MO 65802
C. Red Danish	American Red Danish Cattle Association Marlette, MI 48453

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3. Briggs, Hilton M. and Dinus M. Briggs, Modern Breeds of Livestock, The Macmillan Company, Collier-Macmillan Limited, London, England, 1969.

4. Ensminger, M. E., Animal Science, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.

5. Breed Association publications and journals

CHARACTERISTICS OF THE MAJOR DAIRY BREEDS

BREED	MATURE COW SIZE (lbs.)	*MILK PRODUCTION (lbs.)	*PERCENT BUTTERFAT	*BUTTERFAT PRODUCTION (lbs.)	SIZE OF CALVES AT BIRTH (lbs.)	CATTLE REGISTRATION 1972-73
AYRSHIRE	1100 to 1300	10,312	4.0	415	70 to 80	13,883
BROWN SWISS	1200 to 1400	10,860	4.1	446	90 to 100	15,294
GUERNSEY	800 to 1100	9,179	4.7	436	65 to 75	34,451
HOLSTEIN-FRIESIAN	1100 to 1400	12,684	3.7	466	85 to 95	277,851
JERSEY	600 to 900	8,319	5.1	423	50 to 60	39,396

*These figures were taken from the 1965-66 DHIA records and represent the averages for the various breeds.

ANIMAL SCIENCE

Unit A: Breeds of Livestock and Poultry

Topic 3: Breeds of Swine

*Terms: All terms underlined are included in "Glossary of Terms."

Note: A revised slide set, "Breeds of Swine" is available from Vocational Instructional Services.

I. Introduction

Swine production has become a highly scientific and specialized business in American agriculture. Although hogs are still raised as a supplemental source of income under free range and scavenger types of conditions on many farms, this constitutes only a small percentage of the total swine enterprise. Today, hogs are bred, raised, and fed under extremely controlled conditions.

From the early colonial days through the late 19th century, pork was produced mainly for consumption by the family, and the lard was used for various purposes, such as cooking and soap making. Although hogs were raised and sold for commercial purposes in some areas and even exported as early as 1790, this was due to the lack of refrigeration and processing facilities. Hogs were mostly slaughtered during the cold months, and smoke houses were the major means of preservation. With the initiation of mechanical cooling in the late 1800's and refrigerated railroad cars, pork slaughter and processing became a year around business.

Today the United States ranks high among the nations of the world in total hog numbers and is one of the leading countries in exportation of pork and pork products.

On January 1, 1972, according to the United States Department of Agriculture Statistical Reporting Service there were 62,972,000 head of hogs in the United States. Hogs rank as one of the most important sources of farm income. The consumption of pork in the United States is higher than in any other country of the world with the per capita consumption averaging about 65 pounds. On January 1, 1973, Texas ranked 14th in total number of hogs in the U.S. with 1,264,000, while Iowa was the leading state with 14,556,000.

Transparency No. 1

Individual excellence of animals is important and should be stressed in establishing and maintaining a herd, particularly if the objective is to produce and sell breeding stock. Today, the long, upstanding, lean, non-wasty, but heavily muscled type of hog meets the ideal. Highly controlled selection and breeding programs within breeds, and specialized crossbreeding programs have put the swine industry near the top in production among the various livestock enterprises.

The selection of a breed is largely a matter of personal preference. No one breed is perfect in every respect. Choose a breed of the type and color desired and one that seems to be suited to the conditions under which the hogs are to be raised.

The breeds of hogs that will be discussed could be grouped into the following two categories:

Old Established Breeds	New Breeds
Berkshire	American Landrace
Chester White	Ohio Improved Chester
Duroc	Inbreds
Hampshire	
Hereford	
Poland China	
Spotted Poland China	
Tamworth	
Yorkshire	

In becoming acquainted with these breeds of hogs, it will be interesting to note that with the exception of the American Landrace, Berkshire, Tamworth, and Yorkshire, the breeds of swine common to the United States are strictly American creations.

II. BREEDS OF SWINE

A. Old Established Breeds

BREED	ORIGIN	CHARACTERISTICS
1. Berkshire	a. Originated in Berkshire, England	(1) Color ..... Black with white feet, face, and tip of tail
		(2) Erect ears
	b. Imported to the United States in 1823	(3) Size ..... (a) Smaller than some of the breeds (b) Average mature weight Male: 450-650 lbs. Female: 400-550 lbs.
		(4) The snout is short and turned up.
		(5) In conformation and fleshing, the Berkshire generally conforms to the ideal meat-type hog.

BREED	ORIGIN	CHARACTERISTICS
2. Chester White	a. Originated in Chester and Delaware Counties in Pennsylvania	(1) Color ..... White; small bluish spots or freckles sometimes present on the skin
		(2) Slightly drooping ears
	b. Developed from Yorkshire, Lincolnshire, and Cheshire breeds	(3) Size..... (a) Very large (b) Average Mature Weight: Male: 550-800 lbs. Female: 500-650 lbs.
		(4) Sows are noted for producing large litters of pigs that grow out rapidly.
3. Duroc	a. New England States from the Jersey Reds, red Durocs, and red Berkshires	(1) Color ..... Red, varying from a golden yellow to a deep red. Black flecks may appear but spots are objectionable.
		(2) Drooping ears
	b. Breed standard set in 1885	(3) Size ..... (a) Large, excellent feeding capacity (b) Average Mature Weight: Male: 500-750 lbs. Female: 450-650 lbs.
		(4) In type and conformation, produce a very desirable carcass
		(5) Sows are prolific and have good mothering ability.

BREED	ORIGIN	CHARACTERISTICS	
4. Hampshire	a. Developed in Boone County, Kentucky, from foundation stock known as Thin Rinds and Belted hogs	(1) Color.....	Black, with white encircling the body and including front legs
		(2) Erect ears	
	b. Breed association started in 1893	(3) Size.....	(a) Smaller, more refined than some of the other breeds (b) Average mature weight: Male: 400-600 lbs. Female: 350-550 lbs.
		(4) Exhibit a longer face than most other breeds	
		(5) Sows are very prolific and make good mothers.	
		(6) Used extensively in crossbreeding	
5. Hereford	a. Developed by R. U. Webber of La Plata, Missouri, about 1900	(1) Color.....	Markings resemble that of Hereford cattle; red body color with white face, underline, legs, and switch of tail. Darker shades of red are preferred.
	b. Developed from parent stock of Duroc, Chester White, and OIC breeding	(2) Drooping ears	
		(3) Size.....	(a) Medium sized (b) Average mature weight Male: 800 lbs. Female: 600 lbs.
		(4) Sows are prolific and possess good mothering ability.	
		(5) Criticized for lacking style and quality of other breeds	

BREED	ORIGIN	CHARACTERISTICS
6. Poland China	a. Originated in the Miami Valley region of Ohio in early 1800's	(1) Color..... Black with blazed white face, white feet, white tip of tail
		(2) Drooping ears
	b. Originated for the purpose of converting corn into pork, and became the first lard-type hog	(3) Size..... (a) Very large and upstanding (b) Average Mature Weight: Male: 550-800 lbs. Female: 500-650 lbs.
		(4) Exhibit good length and good hams
	c. Percent stock included the white Byfield hog imported from Russia, the big China hog from Philadelphia, the Berkshire, and the Irish Grazer from Ireland along with native hogs from the area	(5) Produce highly desirable carcasses
7. Spotted Poland China	a. Same origin as the Poland China	(1) Color..... Black and white spotted consisting of 20-80%
	b. In the development, the spotted hogs were selected and maintained and differed significantly from the Poland China only in color.	(2) Drooping ears
		(3) Size.....Same as Poland China
		(4) Resembles the Poland China in conformation and type
		(5) Good feeders

BREED	ORIGIN	CHARACTERISTICS
8. Tamworth	a. Originated in England	(1) Color ..... Red, varying from light to dark
		(2) Erect ears
	b. First imported in 1881	(3) Size ..... (a) Medium size, long body
		(b) Average Mature Weight: Male: 500-650 lbs. Female: 400-550 lbs.
	c. One of oldest breeds of hogs	
	d. Originally developed as a bacon-type hog	(4) Characterized by a long, narrow body; a long, narrow head; and a long snout
		(5) Sows are prolific, make good mothers, and are good foragers.
9. Yorkshire	a. Originated in England; known as the "Large White "	(1) Color ..... White, with occasional black pigment spots in the skin
		(2) Erect ears; slightly dished face
	b. Imported in 1893 to Minnesota	(3) Size ..... (a) Large, long bodied, large boned, and framed
		(b) Average Mature Weight: Male: 500-750 lbs. Female: 450-650 lbs.

B. New Breeds

BREED	ORIGIN	CHARACTERISTICS
1. American Landrace	a. Originated in Denmark	(1) Color..... White; small black spots on the skin are common
	b. First imported in 1934 for experimental crossbreed purposes	(2) Large, drooping ears
	c. Not recorded as purebred until 1949 when Danish government controls were released	(3) Size..... (a) Long bodied, large framed (b) Average Mature Weight: Male: 500-700 lbs. Female: 450-600 lbs.
		(4) Other distinguishing characteristics include a flatter back, a straight snout and trim jowl
		(5) Sows are prolific and noted for good mothering ability.
		(6) Noted for efficient feed utilization and meaty carcass
2. Ohio Improved Chester (O.I.C.)	a. Originated in Ohio	(1) Color..... White hair and skin; small spots may appear on the skin, although this is not desirable.
	b. Developed from White Chesters	(2) Slightly drooping ears
		(3) Size..... (a) Very large (b) Average Mature Weight: Male: 550-800 lbs. Female: 500-650 lbs.
		(4) Other distinguishing characteristics include a wide, short head with a slightly dished face.
		(5) Sows are considered as good mothers and milkers.

3. Inbreds—As a result of swine breeding research at State and Federal experiment stations, a number of inbred lines have been developed from crosses of two or more breeds. The purpose of crossbreeding was to increase growth rate, vigor, and productiveness through heterosis or hybrid vigor. The hybrid is the product of the crossing of two purebreds usually from different breeds. These crossbred or hybrid females generally produce and raise larger litters than parent breeds, and the offspring are more vigorous and make faster gains. These crosses are then inbred, and animals from these inbred

lines have been admitted for registry in various associations. The new breeds of swine developed from inbred lines are shown in Table 1.

Table 1: NEW BREEDS OF SWINE DEVELOPED FROM INBRED LINES

Breed	Parent Stock	Color
Beltsville No. 1	74% Landrace 26% Poland China	Black and white spots
Beltsville No. 2	58% Yorkshire 30% Duroc 6% Landrace 6% Hampshire	Light red
CPF	Beltsville No. 1 San Pierre	Black and white
CPF No. 2	25% Beltsville No. 1 50% Maryland No. 1 25% Yorkshire	Black and white
Maryland No. 1	38% Berkshire 62% Landrace	Black and white spotted
Minnesota No. 1	45% Tamworth 55% Landrace	Red
Minnesota No. 2	40% Yorkshire 60% Poland China	Black with white spots
Minnesota No. 3	Gloucester Old Spot Welch Pig English Large White Beltsville No. 2 and others	Red
Montana No. 1	45% Hampshire 55% Landrace	Black
Palouse	Chester White Landrace	Black
San Pierre	Berkshire Chester White	Black and white

BREED REGISTRY ADDRESSES

American Berkshire Association
601 W. Monroe Street
Springfield, IL 62704

American Landrace Association
Box 111-112½ N. Main Street
Culver, IN 46511

American Yorkshire Club
1001 South Street
Lafayette, IN 47902

Chester White Swine Record Association
817 East Ninth Street
Rochester, IN 46975

Hampshire Swine Registry
1111 Main Street
Peoria, IL 61606

Inbred Livestock Registry Association
Route 4, Box 207-A
Noblesville, IN 46060

National Hereford Hog Record Assn.
Rural Route 3
Dwight, IL 60420

National Spotted Swine Record
c/o Rick Maloney, Secretary
Bainbridge, IN 46105

Ohio Improved Chester Swine Breeders Association
Box 111
Green Castle, IN 46135

Poland China Record Association
501 East Losey Street, P. O. Box 71
Galesburg, IL 61401

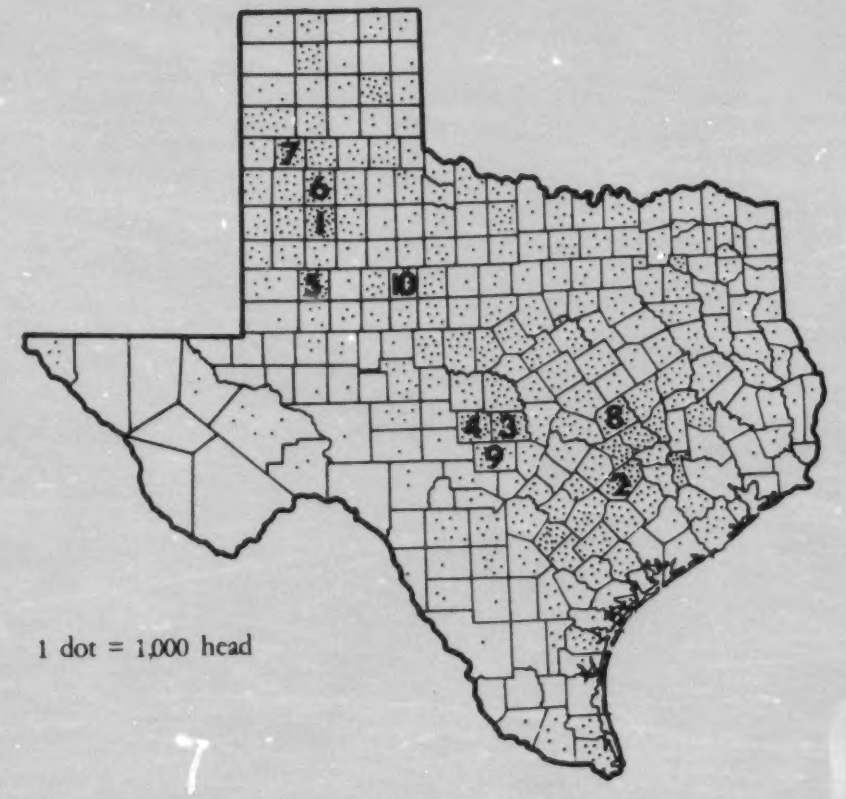
Tamworth Swine Association
Rural Route 2
Cedarville, OH 45314

United Duroc Swine Registry
1803 W. Detweiller
Peoria, IL 61614

REFERENCES:

1. Ensminger, M. E., Animal Science, Sixth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.
2. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.
3. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.
4. Bundy, Clarence E. and Ronald V. Diggins, Swine Production, Second Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.
5. Breed Association publications and references

ALL HOGS
JANUARY 1, 1973



1 dot = 1,000 head

TEN LEADING COUNTIES

	1,000 HEAD
1. LUBBOCK	30.8
2. FAYETTE	28.6
3. LLANO	27.2
4. MASON	25.7
5. DAWSON	25.4
6. HALE	25.3
7. CASTRO	18.7
8. MILAM	17.8
9. GILLESPIE	17.5
10. FISHER	17.2

IN TEXAS 1,264,000

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 4: Breeds of Horses

*Terms: All terms underlined are in the "Glossary of Terms."

I. History of the Horse

The evolution of the horse to its present day type has been established through studies made of fossil remains. The earliest form which was found to have existed on the North American continent was a very small four-toed, even-toothed animal about twelve inches high. These small horses grazed the swamp lands and ranged very short distances. As the oceans receded and the land changed, these horses developed into taller, longer-legged individuals because it became necessary for them to range farther distances from sources of water. In the process, the middle toe grew longer and formed the hoof, and the other toes disappeared into rudimentary toes which are today the splint bones visible under the skin. The teeth became longer for grazing prairie grasses, and the longer legs and hooves provided the speed which was necessary for protection and for grazing great distances.

About 5,000 years ago the horse became extinct on the North American Continent. The disappearance was so complete and so sudden that many scientists believe it was caused by some contagious disease or fatal parasite. Others believe it was a combination of climatic changes, competition, and/or failure to adapt.

The horse was re-established about 500 years ago in North America by the Spanish conquistadores. In the early evolutionary period some of the horses migrated to Asia and Africa where the wild herds, from which our present horses evolved, became established.

There are three species of the horse family:

(1) Horse
(2) Ass or donkey
(3) Zebra, an undomesticated species

The Prazewalsky's horse found in Mongolia is the only living species of the original wild horse today. The ass and zebra are both still found in the wild state.

The horse was the last animal domesticated by man. Man has had tremendous influence on the horse's development since its domestication. The many uses of the horse by man has brought about the great variety of types which are prevalent today. The selective mating of large, heavily muscled horses to produce work animals; the development of refined, longer legged horses for speed; and the development of various gaits for ease in riding or pulling have all been influences of man in the development of the present-day horse.

The horse's role in the development of America should not be under estimated. The horse pulled the wagons west, it provided transportation, it was irreplaceable in the handling of livestock, it carried the mail, and it built the railroads. Generally, racing and rodeos furnished the principal pleasure for man in the early communities. Although today the use of the horse as a source of power has declined because of mechanization, it is still used in many areas. In the western states, the rancher has not found a replacement for the cow horse; in some logging areas and in some small farming areas, draft horses and mules, which are hybrids of horses and asses, are still used.

The horse has never been more popular nor existed in greater numbers in the United States than it does today. Racing is a very popular spectator sport, and horse shows and rodeos continue to reach a new peak in the number of participants and spectators each year. The major income in many states derives from the selling and racing of horses. The value and breeding fees of outstanding horses of various breeds have never been higher.

The development of associations and registries of the various breeds, and their organized activities have influenced the horses popularity tremendously. Each breed has been developed for a particular purpose. Through selective breeding programs, management, and training, each breed has continued to improve.

II. Growth and Decline of the U.S. Horse Industry

Prior to 1900, the automobile and tractor were relatively unknown on the American scene. Horses and mules supplied practically all of the farm power and were widely used for transportation. The horse population in the United States increased up to 1915, at which time a record number of 21,431,000 head was recorded. On January 1, 1968, the horse population in the United States had declined to 6,625,000.

In Texas, the 1930 census showed a peak population of 748,703 horses and 1,036,177 mules and colts. By 1950, the number declined to 387,393 horses and 128,558 mules, and census reports were discontinued. Since then, the horse population has increased but almost entirely in urban and suburban areas for recreation.

In 1970, Texas A&M specialists estimated that there were 600,000 horses with an estimated value of $135,720,000. This would rank horses second only to beef cattle among Texas livestock enterprises, but official government data on horses comparable to those for other livestock are not available.

Texas is the leading state in horse numbers and the headquarters of many national horse organizations. These include the American Quarterhorse Association, Amarillo; National Cutting Horse Association and American Paint Horse Association, Fort Worth; and Palomino Horse Breeders of America, Mineral Wells. Texas also has numerous state horse associations and riding clubs.

III. Types and Classes of Horses

Many diverse and distinct types are recognized within the horse breed. Generally, horses may be classified as light horses, ponies, or draft horses, depending on size, build, and use.

Light horses stand 14-2 to 17 hands high, weigh 900 to 1,400 pounds, and are used primarily for riding, driving, or racing. Light horses generally are more rangy and are capable of more action and greater speed than draft horses.

Ponies stand under 14-2 hands high and weigh 500 to 900 pounds.

Draft horses stand 14-2 to 17-2 hands high, weigh 1,400 pounds or more, and are used primarily for drawing loads and for heavy work.

Transparency No. 1

Horses may be further classified according to specific type and use.

IV. Breeds of Horses

A breed of horses may be defined as a group of horses having a common origin and possessing certain well-fixed, distinctive, uniformly transmitted characteristics that are not common to other horses. An important factor to consider when attempting to choose a particular breed is that certain breeds are better adapted for specific purposes. In this study, an attempt will be made to identify the distinctive characteristics of the breeds of horses.

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
1. American Albino	a. United States; Naper, Nebraska	(1) Color....White hair; pink skin; and light and dark blue, brown, or hazel eyes (2) Height...14 to 15-2 hands (3) Weight...1,000-1,300 lbs.	(a) Riding and exhibition purposes (b) Parade and flag bearer horses
2. American Paint Horse	a. United States	(1) Color....White with any other color; must be a recognizable paint. The two distinct patterns are: Overo and Tobiano. (2) Height...14-1 to 16-2 hands (3) Weight...750-1,300 lbs.	(a) Stock horses (b) Pleasure horses (c) Show purposes (d) Racing
3. American Saddle Horse	a. United States; Fayette County, Kentucky	(1) Color....Bay, brown, chestnut, gray, black, or golden (2) Height...15-16 hands (3) Weight...1,000-1,200 lbs.	(a) Three- and five-gaited horses (saddle) (b) Pleasure horses (c) Stock horses (d) Fine harness horses
4. Appaloosa	a. United States in Idaho, Oregon, and Washington b. From animals originating in Central Asia	(1) Color....Variations and combinations of colors and spots, eye encircled by white, mottled skin, hooves black and white spotted. Usually white over the loin and hips, with spots intermingled (2) Height...14 to 15½ hands (3) Weight...900-1,200 lbs.	(a) Stock horses (b) Pleasure horses (c) Race horses (d) Parade horses

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
5. Arabian	a. Arabia	(1) Color....Bay, gray, and chestnut are predominant; white marks on the head and legs are common. (2) Height... 14 to 15-1 hands (3) Weight...850-1,100 lbs. (4) The beautiful head and neck of the Arabian is one of its most distinguishing characteristics.	(1)Saddle horses (2)Show horses (3)Stock horses (4)Pleasure horses (5)Racing
6. Cleveland Bay	a. In the Cleveland District of Yorkshire, England	(1) Color....Bay with black legs (2) Height... 15-3 to 16 hands (3) Weight...1,250-1,450 lbs.	(a)Stock horses (b)Parade horses (c)Pleasure purposes (d) Used in cross-breeding to produce heavy-weight hunters.
7. Morgan	a. United States in the state of Vermont b. As a general-purpose horse	(1) Color....Bay, brown, black, and chestnut are preferred colors; white markings are less common than in other breeds. (2) Height... 14-2 to 15-2 hands (3) Weight...1,000-1,200 lbs. (4) Noted for pleasing temperament and easy manageability (5) Remarkable endurance	(a)Saddle horses (b)Stock horses

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
8. Palomino	a. United States b. From animals of Spanish descent	(1) Color....Golden and white, silver or ivory mane and tail; coat color is its greatest asset. (2) Height...14-2 to 16 hands (3) Weight...900-1,300 lbs. (4) The type desired in the Palomino will depend entirely on the use for which the horse is intended.	(a)Parade horses (b)Pleasure horses (c)Stock horses (d)Saddle horses
9. Pinto	a. United States b. From horses brought in by Spanish conquistadores	(1) Color....Half color or colors, (bay, brown, black) and half white spots ranging from two to twelve inches across (2) Height...14-1 to 16-2 hands (3) Weight...750-1,300 lbs. (4) Type not color determines whether a horse is properly identified as a Pinto or Paint or both. The Pinto Registry accepts several breed types while the Paint Horse Association accepts only Quarter or Thoroughbred confirmation.	(a)Hunters (b)Polo mounts (c)Racing (d)Saddle horses (e)Stock horses
10. Quarter Horse	a. United States; primarily in the southwestern states of Texas, Oklahoma, New Mexico, Colorado, and Kansas	(1) Color....Chestnut, sorrel, bay, dun, palomino, black, brown, and roan (2)Height....14 to 16 hands (3)Weight....1,050-1,300 lbs. (4)Well-muscled and powerfully built; considered the most versatile of all	(a)Stock horses (b)Racing (c)Pleasure horses

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
11. Standard Bred	a. United States	(1) Color.... Bay, brown, chestnut, black, gray, roan, and dun (2) Height...15 to 16 hands (3) Weight...900-1,300 lbs. (4) The breed was developed primarily for harness racing; a pleasing conformation and an abundance of style and quality are important requirements.	(a) Harness racing (b) Trotting or pacing (c) Show horses
12. Tennessee Walking Horse	a. Tennessee, United States	(1) Color.... Sorrel, chestnut, black, roan, white, bay, brown, gray, and golden (2) Height... 14 to 15 hands (3) Weight...1,000-1,200 lbs. (4) The running walk is distinctive to the breed.	(a) Plantation walking horses (b) Pleasure horse (c) Show horse
13. Thoroughbred	a. England b. Developed as a running horse	(1) Color.... Bay, brown, chestnut, sorrel, black, and gray; white markings on the face and legs are common. (2) Height... 15 to 17 hands (3) Weight...900-1,400 lbs. (4) Conformation emphasizes factors contributing to racing and sports.	(a) Race horses (b) Saddle horses (c) Stock horses (d) Hunters and jumpers (e) Polo mounts

B. Ponies

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
1. Hackney	a. England	(1) Color....Chestnut, bay, and brown are most common; white markings are desirable.	(a) Heavy harness or carriage horses (b) Valued chiefly for show purposes (c) Also for cross-breeding to produce hunters and jumpers
		(2) Height... 12 to 16 hands (i) Hackneys under 14-2 are referred to as ponies. (ii) Those over 14-2 are referred to as horses.	
		(3) Weight...800-1,200 lbs.	
		(4) A heavy horse for its size with considerable width through the chest	
2. Pony of the Americas	a. United States; Mason City, Iowa	(1) Color....Very similar to the Appaloosa; several color patterns are acceptable.	(a) Western type using pony for youth
		(2) Height... At maturity the POA must have a minimum height of 46" and a maximum height of 54" at the withers.	
		(3) Weight...400-800 lbs.	
		(4) The breed standard calls for a conformation between that of the Quarter Horse and the Arabian.	

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
3. Shetland Pony	a. Shetland Isles	(1) Color.... Black, dark brown, bay, chestnut, mouse, and spotted are most common. (2) Height... Two class sizes are recognized by breed registry: (i) 43" and under (ii) 43" to 46" (3) Weight... 300-500 lbs. (4) Develops long shaggy outer coat during winter months and has a full mane and tail (5) Smaller size of show ring type is more desirable.	(a) Child's mount (b) Harness (c) Racing (d) Roadster
4. Welsh Pony	a. Wales	(1) Color.... Black, gray, bay, roan, cream, or chestnut (2) Height... Two divisions are acceptable in the American Welsh Stud Book: "A" Division: Cannot exceed 12-2 hands. "B" Division: Over 12-2 and not more than 14 hands. (3) Weight... Usually less than 500 lbs. on "A" type. On "B" type, 500-900 lbs.	(a) Child's mount (b) Harness racing (c) Pleasure riding (d) Parade (e) Hunting

C. Draft Horses

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
1. American Cream Horse	a. United States b. Only draft horse breed to originate in the U.S.	(1) Color....Cream, with white mane and tail	(a) Exhibition purposes (b) Farm work
		(2) Size..... Medium draft breed Average mature weight Male: 1,700-1,900 lbs. Female: 1,500-1,700 lbs.	
		(3) Docile	
2. Belgian	a. Belgium	(1) Color....Bay, chestnut, and roan are most common, but browns, grays, and blacks are occasionally seen	(a) Exhibition purposes (b) Special attractions (c) Farm work
		(2) Size..... Known for its draftiness, wide deep, compact, low set Average Mature weight Male: 1,900-2,200 lbs. Female: 1,850-2,100 lbs.	
		(3) Very docile and quiet	
3. Clydesdale	a. Scotland b. First imported to Canada in the 1870's	(1) Color....Bay and brown with white markings are most common, but blacks, grays, chestnuts, roans are occasionally seen.	(a) Exhibition purposes (b) Special attraction (c) Farm work
		(2) Size..... Medium draft breed Average mature weight Male: 1,700-1,900 lbs. Female: 1,500-1,700 lbs. Height: 16-17 hands	
		(3) Superior style and action	
		(4) Heavy feathering of feet	

BREED	ORIGIN	DISTINGUISHING CHARACTERISTICS	USES
4. Percheron	a. France b. First imported in the 1840's	(1) Color.... Black or gray, occasionally bays, browns, chestnuts, and roans are seen. (2) Size..... Between the Clydesdale and Belgian Average mature weight Male: 1,800-2,000 lbs. Female: 1,700-1,850 lbs. Height: 16-1 to 16-3 hands (3) Extremely docile (4) Noted for its clean-cut head	(a) Exhibition purposes (b) Special attractions (c) Farm work
5. Shire	a. England b. First imported in 1836 to Canada	(1) Color.... Bay, brown, black with white markings, occasionally grays, chestnuts, and roans are seen. (2) Size..... The tallest draft breed Average mature weight Male: 1,900-2,200 lbs. Female: 1,850-2,100 lbs. Height: 16 to 17 hands (3) Docile (4) Feathers or hair on the legs	(a) Exhibition purposes (b) Special attractions (c) Farm work
6. Suffolk	a. England b. First imported in the 1880's	(1) Color.... Chestnut varying from light to dark; no white (2) Size..... Smallest draft breed Average mature weight Male: 1,600 to 1,800 lbs. Female: 1,450-1,600 lbs. Height: 15-2 to 16-2 hands (3) Excellent disposition (4) Conformation is of the chunky type.	(a) Exhibition purposes (b) Special attractions (c) Farm work

HORSE BREED REGISTRY ADDRESSES

Breeds of Light Horses

1. American Albino Association, Inc.
   Box 79
   Crabtree, OR 97335

2. American Paint Horse Association
   Box 12487
   Fort Worth, TX 76116

3. American Saddle Horse Breeders Association
   929 South Fourth Street
   Louisville, KY 40203

4. Appaloosa Horse Club, Inc.
   P. O. Box 403
   Moscow, ID 83843

5. Arabian Horse Registry of America, Inc.
   One Executive Park
   7801 E. Belleview Avenue
   Englewood, CO 80110

6. Cleveland Bay Society of America
   White Post, VA 22663

7. The Morgan Horse Club, Inc.
   P. O. Box 2157
   West Hartford, CT 06117

8. The Palomino Horse Association, Inc.
   P. O. Box 324
   Jefferson City, MO 65101

9. Pinto Horse Association of America, Inc.
   P. O. Box 3984
   San Diego, CA 92103

10. American Quarter Horse Association
    P. O. Box 200
    Amarillo, TX 79105

11. Standardbred—United States Trotting
    Association
    750 Michigan Avenue
    Columbus, OH 43215

12. Tennessee Walking Horse Breeders
    Association of America
    P. O. Box 286
    Lewisburg, TN 37091

13. Thoroughbred—The Jockey Club
    300 Park Avenue
    New York, NY 10022

Breeds of Ponies

1. American Hackney Horse Society
   527 Madison Avenue
   Room 725
   New York, NY 10022

2. Pony of the Americas Club, Inc.
   P. O. Box 1447, 1452 N. Federal
   Mason City, IA 50401

3. American Shetland Pony Club
   P. O. Box 468
   Fowler, IN 47944

4. Welsh Pony Society of America
   Rural Delivery 1, Box 126-F
   Glenmoore, PA 19343

Breeds of Draft Horses

1. American Cream Horse Association
   Hubbard, IA 50122

2. Belgian Draft Horse Corporation of
   America
   Wabash, IN 46996

3. Clydesdale Breeders' Association of
   the United States
   Batavia, IA 52533

4. Percheron Horse Association of America
   Rural Route 1
   Belmont, OH 43718

5. American Shire Horse Association
   Lynden, WA 98264

6. American Suffolk Horse Association, Inc.
   Lynden, WA 98264

REFERENCES:

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3. Briggs, Hilton M. and Dinus M. Briggs, Modern Breeds of Livestock, The Macmillan Company, Collier-Macmillan Limited, London, 1969.

4. Ensminger, M.E., Horses and Horsemanship, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.

5. Horse breed association publications and journals

CLASSIFICATION OF HORSES ACCORDING TO TYPE AND USE

A. Riding Horses:

1. SADDLE (THREE GAITED, FIVE GAITED)
2. WALKING
3. STOCK
4. POLO
5. HUNTERS AND JUMPERS
6. PONIES

B. Race Horses:

1. RUNNING (THOROUGHBRED, QUARTER ETC.)
2. HARNESS (TROTTERS AND PACERS)

C. Driving horses:

1. HEAVY HARNESS
2. FINE HARNESS
3. ROADSTERS
4. PONIES (HEAVY AND LIGHT HARNESS)

D. Work horses:

1. DRAFT
2. WAGON
3. EXHIBITION

ANIMAL SCIENCE

Unit A: Breeds of Livestock and Poultry

Topic 5: Breeds of Goats

*Terms: All terms underlined are included in the "Glossary of Terms."

Note: A 2" x 2" slide set, "Breeds of Sheep and Goats," is available from Vocational Instructional Services.

I. Importance of Milk Goats

Goats were one of the first animals domesticated by man. According to the Old Testament, the goat—a very versatile animal—furnished milk, meat, and clothing for man; and its skin was used to make containers. Ancient, wandering tribes carried their goats with them so as to insure a constant supply of food. Many people in the world prefer goat's milk to other milk. When the late Mahatma Ghandi of India visited England, he took along two milk goats to provide him with milk.

The first milk goats introduced into the U.S. were brought over from Europe by the settlers of the Virginia colonies.

Because of goat milk's fine, soft curd, it is more easily digested than cow's milk; however, according to W. R. Steffen in an article in the American Journal of Veterinary Medicine, the chemical analysis of goat's milk is similar to that of cow's milk, with the percentage of butterfat and other elements being about the same.

Good management is required to produce quality goat milk.

The average milk goat produces about two quarts of milk per day; however, many goats exceed this production. Some milk goats on official tests have produced as much as 4,600 pounds of milk in a ten months' lactation.

II. Importance of Angora Goats

Located on a high plateau that varies from one to four thousand feet above sea level, the Angora province in Turkey was the origin of the Angora goat and is the area for which the Angora goat was named.

In 1881, the Sultan of Turkey, recognizing the value of the lustrous fiber produced by the Angora goat, passed an edict prohibiting the exportation of the Angora goat from his country. His purpose was to confine the production of mohair to Asia Minor, thereby giving his country a monopoly of the mohair trade.

Dr. James B. Davis of South Carolina introduced the first Angora goats into this country in 1849, which was thirty-two years before the Sultan's edict. The breeding of a few imported Angora goats to Spanish goats, which were brought to this country by Spanish explorers, furnished the foundation of the great goat and mohair industry in the U.S. today. To develop the Angora goat, Angora bucks were bred to Spanish does; and in a period of five generations were considered to be "full bloods." The first Angora goats were introduced into Texas by Colonel W.W. Haupt of Hays County in 1858.

Mohair, the wonder fiber produced by the Angora Goat, is used to make fine fabrics for clothing, upholstery, drapes, and carpets. The fiber is very durable, dyes brilliantly, and retains color well. Texas exports large volumes of mohair, principally to the United Kingdom, Italy, and Japan. Angora goat meat, called chevon, is used in a blend with other meats to produce several meat products sold by packing plants. Also, the meat of Angora goat kids and Spanish goat kids, called cabrito in the Southwestern part of Texas, is preferred by some people in that area.

Transparency No. 1

Nearly 50 percent of the world's mohair, and 97 percent of the U.S. clip, is produced in Texas. Angora goats, producing mohair, are largely confined to the Edwards Plateau and some nearby central and northcentral Texas counties. Goats numbered 2,058,000 on January 1, 1971, in Texas, compared with 2,572,000 in 1970.

Mohair production in 1970 was 16,005,000 pounds valued at $6,258,000, an average of 39.1 cents per pound.

A. Breeds of Dairy Goats

BREED	ORIGIN	CHARACTERISTICS
1. French-Alpine	a. The French Alps	(1) Color..... (a) No standard color
	b. Imported in 1922	(2) Size..... Large, rangy (a) Buck—165-170 lbs. (b) Doe—120-135 lbs.
		(3) Production.... (a) Butterfat—4.0% (b) Milk—1,500-1,600 lbs.
		(4) Other..... (a) Ears are medium sized and erect. (b) Short haired (c) Males have a pronounced beard. (d) Some are horned.
2. Nubian	a. Nile Valley Nubia	(1) Color..... (a) Black and white, tan and white, red and white
	b. Imported in 1900	(2) Size..... (a) Bucks—150 lbs. (b) Does—100 lbs.
		(3) Production.....(a) Butterfat—5.02% (b) Milk—1,300-1,500 lbs.
		(4) Other..... (a) Long, pendulous ears hang close to head. (b) Roman nose (c) Always short-haired
3. Saanen	a. Saanen Valley, Switzerland	(1) Color..... (a) White or creamy white
	b. Imported by U.S. D.A. in 1889	(2) Size..... (a) Buck—160-185 lbs. (b) Doe—120-135 lbs.
		(3) Production.... (a) Milk—1,800-2,000 lbs. (b) Butterfat—3.59%
		(4) Other..... (a) Ears point upward and forward. (b) Straight or slightly dished face (c) No wattles (d) Doe-bearded

BREED	ORIGIN	CHARACTERISTICS
4. Toggenburg	a. Toggenburg Valley, Switzerland	(1) Color..... (a) Brown body (b) Two white strips on face, white on legs below knees
	b. Introduced into Ohio in 1893	(2) Size..... Smallest breed of dairy goat (a) Buck—150-160 lbs. (b) Doe—100-120 lbs.
		(3) Production.....(a) Milk—1,500-1,600 lbs. (b) Butterfat—3.18%
		(4) Other .....(a) Ears are erect and point forward. (b) Hair coat is short and very fine. (c) Wattles (d) Hardy and versatile
B. The Angora Goat		
1. Angora	a. Imported from Angora, Turkey and South Africa	(1) Color..... (a) White (b) Other colors undesirable
	b. Crossed with Spanish goats	(2) Size ..... Small as compared to milk goats (a) Buck—125-175 lbs. (b) Doe—80-90 lbs.
		(3) Bucks and does horned and polled
		(4) Production .... (a) 4-10 lbs. mohair per year (b) One or two kids annually (c) Mutton characteristics are not considered as important as mohair.
		(5) Very adaptable to agricultural areas such as Edwards Plateau

BREED ASSOCIATIONS

American Dairy Goat Association
P. O. Box 186
Spindale, NC 28160

American Angora Goat Breeders Association
Rockspring, TX 78880

REFERENCES:

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2. Briggs, Hilton M. and Dinus M. Briggs, Modern Breeds of Livestock, The Macmillan Company, Collier-Macmillan Limited, London, England, 1969.
3. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.
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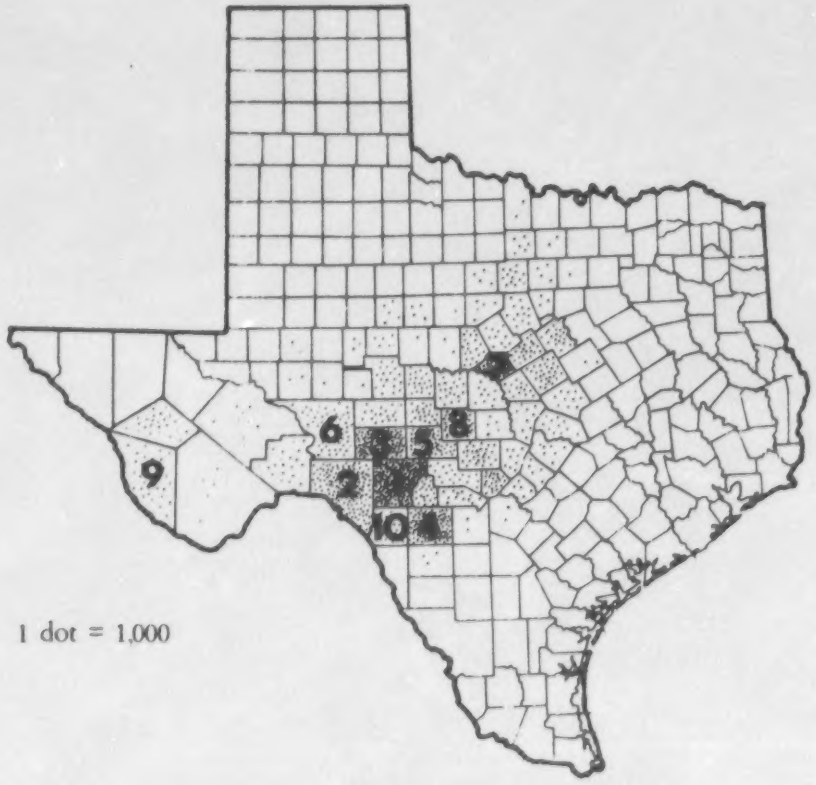
ALL ANGORA GOATS
JANUARY 1, 1973



TEN LEADING COUNTIES	1,000 HEAD
1. EDWARDS	184
2. VAL VERDE	142
3. SUTTON	109
4. UVALDE	107
5. KIMBLE	64
6. CROCKETT	61
7. MILLS	53
8. MASON	42
9. PRESIDIO	32
10. KINNEY	31

IN TEXAS 1,375,000

ANIMAL SCIENCE

Unit A: Breeds of Livestock and Poultry

Topic 6: Breeds of Sheep

*Terms: All terms underlined are included in the "Glossary of Terms."

Note: A 2 x 2 slide set, "Breeds of Sheep and Goats," is available from Vocational Instructional Services.

I. Importance of Sheep

Sheep and wool production, mentioned in the Bible, is one of our oldest livestock industries. Early man depended upon sheep for his clothing, meat, tallow, and milk. Fabrics of wool have been unearthed in the ruins of villages inhabited by the Swiss Lake dwellers ten thousand years ago. Sheep were introduced to the American continent by Spanish conquerors; Columbus found room on his ship for sheep on his second voyage to the American continent.

There were two main reasons for the rapid development of the sheep industry in the U.S. The first was the need for wool for clothing, and the second was the demand for lamb and mutton by the large influx of foreign laborers, who were accustomed to eating lamb and mutton.

The sheep population in the world today has increased by about 22% during the past 10 years; however, the sheep population in the U.S. has decreased by about 1/3 during that same period. U.S. sheep numbers went from about 31,761,000 head in 1960 to 17,726,000 head in 1973. In the U.S., Texas is the leading state in sheep and lamb numbers with 3,214,000 head in 1973. This accounts for about 20% of the U.S. sheep, with 50% of those in Texas concentrated in the 40-county area known as the Edwards Plateau.

Transparency No. 1

The decrease in the consumption of lamb and mutton from 6.6 pounds per capita in 1940 to 4.0 pounds per capita in 1966, and the decrease in the use of wool caused by the increased use of synthetic fibers, has been responsible for the decrease in sheep numbers.

The Merino and Rambouillet breeds are the foundation of the Texas sheep industry representing about 89 percent of the sheep. One percent of the sheep in Texas are the mutton or medium wool breeds, and 10 percent are crossbreeds; either white or black face crosses.

II. Kinds of Sheep Breeders

There are two types of sheep breeders, the registered and the commercial. The breeder of registered sheep tries to produce breeding sheep that will be in demand by other breeders of registered sheep and the commercial producer.

The commercial producer can be further divided into two kinds: the farm flock owner and the rancher.

The farm flock owner generally has a small flock of sheep that are grazed on permanent pastures and crop residue. He usually produces cross-bred lambs by breeding a medium wool ram on fine wool ewes. The off-spring from this cross have more desirable conformation and fattening qualities than do fine wool lambs, and the flock owner is able to demand a better price for the wool sheared from his fine wool ewes than he would from cross-bred ewes.

The rancher controls a large area of land, a large number of sheep, and may use one or more systems, or a combination of systems to produce wool and meat. Most ranchers run a ewe-lamb operation. With this system the rancher tries to produce lambs and wool from the ewes. He sells the ewe and wether lambs as Easter lambs, fall lambs, spring lambs, old-crop lambs, or as feeders. Depending on several factors, the method he chooses will vary from year to year. In combination with a ewe-lamb operation, many ranchers in the Edwards Plateau area of Texas run muttons. It is estimated that 10% of the grown sheep in that area are muttons. There are several advantages in running muttons: (1) Muttons produce more wool than ewes. (2) Muttons require less labor and feed than a ewe-lamb operation. (3) The mutton increases in size and weight with age, up to about four years of age.

III. How Sheep Are Classified

Breeds of sheep may be classified on several different factors, including (1) their suitability for mutton or wool production, (2) white face or black face, (3) horned or polled, (4) type of wool produced, and (5) area in which they originate.

The most common classification of sheep is based on types of wool. Table 1 below presents these classes and the common breeds of sheep for each wool type.

TABLE 1: CLASSES AND COMMON BREEDS OF SHEEP

Fine-wool Type	Medium-wool Type	Long-wool Type	Cross-bred Type	Fur-wool Type
American Merino	Cheviot	Cotswold	Columbia	Karakul
Delaine Merino	Dorset	Leicester	Corriedale	
Merino	Hampshire	Lincoln	Targhee	
Rambouillet	Oxford	Romney		
Debouillet	Shropshire			
	Southdown			
	Suffolk			

Since there are over 200 breeds of sheep, this topic will contain only the more popular breeds.

IV. Breeds of Sheep

BREED	ORIGIN	CHARACTERISTICS
A. Fine-wool breeds 1. American Merino, Delaine Merino, or Merino	a. Originated in Spain. The name Merino came from the early day royal office of Spain, called Merino. b. All three breeds were developed from the Spanish Merino, which was imported to the U. S. from Spain in 1793. c. The name used depends on type. American Merino has wrinkles and skin folds. The Delaine Merino has smooth skin.	(1) Wool..... (a) Fine spinning count 64's-80's (b) Staple length—2¼-4" (c) Fleece weight—6-14 lbs. (d) Shrinkage—45-60% (2) Rams either horned or polled. Ewes are polled. Head and legs covered with wool. (3) ~~Size~~..... (a) Rams: 150-200 lbs. (b) Ewes: 110-150 lbs. (4) Color.....(a) White face and legs (b) Pink skin (c) Reddish lips and nostrils (5) Production... (a) Good grazers (b) High producers of wool both in quantity and quality (c) Slow growers (d) Good suckling qualities (e) Long productive life (f) Extremely hardy
2. Debouillet	a. A.D. Jones, Roswell, New Mexico b. Developed by crossing Delaine Merino rams to Rambouillet ewes c. Developed under practical range conditions	(1) Wool..... (a) Fine, spinning count, 60's-70's (b) Staple length—2½-3½ in. (c) Fleece weight—8-16 lbs. (d) Shrinkage—55-70% (2) Rams are horned or polled. Ewes are polled. Open faced characteristic. (3) Size..... (a) Rams: 150-250 lbs. (b) Ewes: 125-170 lbs. (4) Color (a) White face and legs (b) Flesh colored lips and nostrils (c) Black spots not uncommon

Debouillet (continued)

BREED	ORIGIN	CHARACTERISTICS
		(5) Production... (a) They do an acceptable job of wool and mutton production under adverse conditions. (b) Production is fairly uniform in grade of wool.
3. Rambouillet	a. Rambouillet, France b. Developed from the Spanish Merino c. First introduced into the U.S. in 1840	(1) Wool..... (a) Fine, spinning count, 62's-80's (b) Staple length—2¼-4" (c) Fleece weight—7-14 lbs. (d) Shrinkage—45-65% (2) Rams are horned or polled. Ewes are polled. Large, wide head mostly covered with wool. (3) Size..... Largest of the fine-wool breeds (a) Rams: 190-300 lbs. (b) Ewes: 120-210 lbs. (4) Color.....(a) White face and legs (b) Flesh colored lips and nostrils (5) Production... (a) Good mothers, prolific (b) Very good range qualities (c) Tendency for face covering of wool (d) Reasonably good meat qualities (e) Production is very acceptable in quantity and quality of wool.
B. Medium Wool, Mutton or Meat Breeds		
1. Cheviot	a. Cheviot Hills between England and Scotland b. First imported to the U.S. in 1838.	(1) Wool..... (a) Medium, spinning count, 48's-56's (b) Staple length—3-4" (c) Fleece weight—5-8 lbs. (d) Shrinkage 25-50%

Cheviot (continued)

BREED	ORIGIN	CHARACTERISTICS
		(2) Rams and ewes are polled. No wool is on the head and face, nor below the knees and hooks.
		(3) Size..... One of the smaller breeds (a) Rams: 150-200 lbs. (b) Ewes: 90-165 lbs.
		(4) Color.....(a) White face (b) Black nostrils, lips, and feet (c) Black spots on legs, ears, and face not uncommon
		(5) Production.....(a) Good mothers (b) Small at birth (c) Slow growers, but hardy (d) Slow to fatten (e) Good grazers on rough pastures (f) Average about 125% lamb crop
		(6) A very attractive breed with head carried high, erect ears, and a quick coordinated stride
2. Dorset	a. Dorset and Somerset Counties, England b. First importation to the U.S. was made in 1885.	(1) Wool..... (a) Medium, spinning count 36's-56's (b) Staple length—$2\frac{1}{2}$-4" (c) Fleece weight—4-10 lbs. (d) Shrinkage—25-50%
		(2) A unique feature is that there are both horned and polled strains. Within the horned strain, ewes are horned. Face and ears are practically free from wool.
		(3) Size..... Medium-sized breed (a) Rams: 150-225 lbs. (b) Ewes: 120-190 lbs.
		(4) Color.....(a) White face, ears, and legs (b) Pink nostrils, lips, and skin (c) White hooves

Dorset (continued)

BREED	ORIGIN	CHARACTERISTICS	
		(5) Production.....	(a) Heavy milkers (b) Fast growers (c) Average carcass quality (d) Poor grazers (e) Fair feeders (f) Ewes will breed out of season. (g) Average nearly a 150% lamb crop (h) One of the lighter shearing breeds
3. Hampshire	(a) Hampshire County, England (b) Several importations were made to the U.S. prior to 1860.	(1) Wool.....	(a) Medium, spinning count, 46's-60's (b) Staple length—2-2½" (c) Fleece weight—4-10 lbs. (d) Shrinkage—38-50% (e) Fleece is of medium quality.
		(2) Rams and ewes are polled. Bald head and prominent ears are distinctive.	
		(3) Size.....	Among the largest of medium wool breeds (a) Rams: 170-275 lbs. (b) Ewes: 135-215 lbs.
		(4) Color.....	(a) Dark brown or black face, ears, and legs
		(5) Production.....	(a) Very desirable carcasses (b) Rapid growers and aggressive feeding habits (c) Heavy milkers (d) Long, deep bodied (e) Heads criticized for being large, long, and having Roman nose (f) Used extensively in cross-breeding with excellent results

BREED	ORIGIN	CHARACTERISTICS
4. Oxford	a. Oxford County, England b. First introduced ot the U.S. in 1846 c. Resulted from crossing Cotswold and Hampshires	(1) Wool.....(a) Medium, spinning count, 46's-50's (b) Staple length—3-5" (c) Fleece weight—8-12 lbs. (d) Shrinkage—38-50% (2) Rams and ewes are polled. Easily distinguished from other breeds by top knot of wool over the head (3) Size..... Largest of the medium-wool breeds (a) Rams: 200-275 lbs. (b) Ewes: 150-225 lbs. (4) Color..... (a) Light gray, dark gray, or brown face, ears, and legs (b) Pink skin; head and ears small (5) Production.....(a) Prolific and good milkers (b) Large and vigorous at birth (c) Rapid growers (d) Slow finishers (e) Lambing percentages of 150% are not uncommon. (f) Heaviest fleece of any of the Down breeds
5. Shropshire	a. Shropshire and Stafford Counties, England b. First importation was made into Virginia in 1855. c. Developed from several breeds including the Southdown, the Leicester, and the Cotswold	(1) Wool..... (a) Medium, spinning count, 48's-60's (b) Staple length—$2\frac{1}{2}$-3" (c) Fleece weight—5-10 lbs. (d) Shrinkage—25-50% (2) Rams and ewes are polled. Dense wool covers the poll, face, and legs. (3) Size.....(a) Rams: 150-225 lbs. (b) Ewes: 120-170 lbs. (4) Color.....(a) Deep brown colored face, ears, and legs (b) Black hooves

BREED	ORIGIN	CHARACTERISTICS

C. Long Wool Breeds

1. Cotswold

a. Gloucestershire, England

b. First imported to U.S. in 1832

(1) Wool..... (a) Coarse, spinning count, 36's-40's
(b) Staple length—8-14"
(c) Fleece weight—10-15 lbs.
(d) Shrinkage—20-35%
(e) Fleece carried in rather bold locks.

(2) Rams and ewes are polled. Most distinguishing characteristic is foretop of wool hanging from forehead down to the eyes.

(3) Size..... (a) Rams: 250-275 lbs.
(b) Ewes: 175-225 lbs.

(4) Color..... (a) White face with grayish specks
(b) Black nostrils, lips, and skin about the eyes
(c) White or flecked with white and gray legs

(5) Production..... (a) Prolific and good milkers
(b) Rapid growers, slow to fatten
(c) Meat coarse-textured
(d) Better grazers than Lincoln
(e) Hardy and active
(f) Demonstrated its greatest usefulness in crossing on commercial herds lacking size

(6) The breed has never been very popular in the United States.

2. Leicester

a. Leicester County, England

b. First brought to the U.S. prior to the Revolutionary War.

(1) Wool..... (a) Coarse, spinning count, 40's-48's
(b) Staple length—6-8"
(c) Fleece weight—9-12 lbs.
(d) Shrinkage—20-35%

Leicester (continued)

BREED	ORIGIN	CHARACTERISTICS
		(2) Rams and ewes are polled. Face and legs are free of wool.
		(3) Size..... Medium in size (a) Rams: 225-250 lbs. (b) Ewes: 175-200 lbs.
		(4) Color.....(a) White face (b) Black lips and nostrils, black spots on face and other parts
		(5) Production.....(a) Not adapted to sheep raising requirements (b) Ewes are good milkers but are not very prolific. (c) Do not finish at proper weight (d) Large amounts of external fat (e) Not adapted to severe weather (f) Used primarily for crossing purposes in the U.S.
3. Lincoln	a. Lincolnshire, England b. First imported to the U.S. about the close of eighteenth century	(1) Wool.....(a) Coarse, spinning count, 36's-46's (b) Staple length—8-14" (c) Fleece weight—12-20 lbs. (d) Shrinkage—20-30%
		(2) Rams and ewes are polled. Large head and ears and pronounced forelock are characteristic.
		(3) Size..... Referred to as the largest breed of sheep (a) Rams: 250-350 lbs. (b) Ewes: 175-250 lbs.

Lincoln (continued)

BREED	ORIGIN	CHARACTERISTICS
		(4) Color.....(a) White face (b) Dark lips, nostrils, and legs (c) Spots occur on ears and legs and occasionally on the face
		(5) Production.....(a) Prolific and good milkers (b) Rapid growers (c) Fatten at heavyweight (d) Large amount of external fat (e) A very rugged and heavy breed of sheep (f) Produce the heaviest and coarsest fleece of long-wool breeds
4. Romney	a. Kent County, England b. First introduced into U.S. in 1904	(1) Wool.....(a) Coarse, spinning count, 44's-50's (b) Staple length—5-6" (c) Fleece weight—10-12 lbs. (d) Shrinkage—20-35% (e) Fleece has more compactness and crimp than other breeds
		(2) Rams and ewes are polled. Distinguished by a foretop of wool between the eyes and wool on the jaw.
		(3) Size.....Medium sized breed (a) Rams: 225-250 lbs. (b) Ewes: 120-200 lbs.
		(4) Color.....(a) White face and legs (b) Dark nostrils, hooves, and legs
		(5) Production.....(a) Very hardy (b) Good grazers (c) Carcass quality is more acceptable than other long-wool breeds

Romney (continued)

BREED	ORIGIN	CHARACTERISTICS	
			(d) Suckle well (e) Finish easier than other long-wool breeds (f) Ewes cross well with rams of other breeds

D. Crossbred – Wool Breeds

1. Columbia	a. King Ranch, Laramie, Wyoming b. First breed of sheep developed in the United States; Lincoln rams were crossed on Rambouillet ewes. c. The breed was officially started by the Bureau of Animal Industry in 1917.	(1) Wool.....	(a) 3/8 blood wool, spinning count, 50's-58's (b) Staple length—$3\frac{1}{2}$-5" (c) Fleece weight—10-18 lbs. (d) Shrinkage—45-55%
		(2) Rams and ewes are polled. Identified by an open face covered with white hair	
		(3) Size.....	Largest of the crossbred-wool breeds (a) Rams: 75-300 lbs. (b) Ewes: 130-225 lbs.
		(4) Color.....	(a) Face white and free of wool (b) Occasional black spots on face and ears (c) White hooves and legs
		(5) Production.....	(a) Prolific and good milkers (b) Fair carcass quality (c) Rapid growers (d) Fattening quality is fair (e) Lambs are of good conformation and feeding quality.
		(6) Well suited to western range conditions	

BREED	ORIGIN	CHARACTERISTICS
2. Corriedale	a. New Zealand	(1) Wool..... (a) 3/8 blood, spinning count, 50's-60's (b) Staple length—3½-6" (c) Fleece weight—8-17 lbs. (d) Shrinkage—40-50% (e) Fleece is of excellent quality.
	b. The breed was developed by crossing Lincoln and Leicester rams on Merino ewes.	
	c. First brought to the U.S. in 1914 by the National Wool Growers' Association	(2) Rams and ewes are polled. Open face is characteristic.
		(3) Size..... (a) Rams: 150-250 lbs. (b) Ewes: 105-205 lbs.
		(4) Color..... (a) White face, ears, and legs (b) Occasional black spots on face and ears
		(5) Production..... (a) Outstanding producers, producing more lambs and pounds of wool per body weight than other range breeds (b) Early maturing (c) Good mutton conformation (d) Considered very satisfactory for range conditions
3. Targhee	a. Dubois, Idaho	(1) Wool..... (a) 3/8 blood to fine, spinning count, 58's-64's (b) Staple length—2½-4½" (c) Fleece weight—11-14 lbs. (d) Shrinkage—45-50%
	b. The breed was developed by breeding Rambouillets, Corriedales, and Lincolns in 1926 at the United States Sheep Experiment Station.	(2) Rams and ewes are polled.
		(3) Size..... Intermediate (a) Rams: 175-235 lbs. (b) Ewes: 120-160 lbs.
	c. Named for the Targhee National Forests	(4) Color..... (a) White face (b) White legs

Targhee (continued)

BREED	ORIGIN	CHARACTERISTICS
		(5) Production..... (a) Quality lambs (b) Adapted to the range area (c) Little emphasis in fancy points
E. Fur-Type Breed		
1. Karakul	a. South Central Asia, Bokhara, USSR b. First importation to the U.S. was in 1909 by Dr. C. C. Young of Belen, Texas	(1) Wool..... (a) Fur-type (b) Lambs killed 3 to 10 days of age for pelts (c) Fleece is light-weight and of low grade. (2) Rams are horned and ewes are polled. Characterized by long, narrow faces and long, drooping ears (3) Size..... Medium-sized breed (a) Rams: 175-225 lbs. (b) Ewes: 135-160 lbs. (4) Color.....(a) Brown or black (b) Black head, mouth, nostrils, feet, and legs (5) Production.....(a) Body narrow and uneven (b) Legs lack fullness (c) Ewes are good milkers. (d) Lambs discounted on market (e) Ewes not prolific (f) A hardy breed under adverse conditions

V. BREED REGISTRIES AND ASSOCIATIONS

Breed	Registries and Associations
A. Fine-Wool Breeds	
1. American Merino, Delaine Merino, Merino	1. Texas Delaine Merino Record Association Route 1 Burnett, TX 78611
2. Rambouillet	1. American Rambouillet Sheep Breeders' Association 2709 Sherwood Way San Angelo, TX 76901
3. Debouillet	1. Debouillet Sheep Breeders' Association Roswell, NM 88201
B. Medium-Wool, Mutton, or Meat Breeds	
1. Cheviot	1. American Cheviot Sheep Society P. O. Box 5051 Lafayette Hill, PA 19444
2. Dorset	1. Continental Dorset Club P. O. Box 577 Hudson, IA 50643
3. Hampshire	1. American Hampshire Sheep Association Stuart, IA 50250
4. Oxford	1. American Oxford Down Record Association Eaton Rapids, MI 48827
5. Shropshire	1. American Shropshire Registry Association P. O. Box 1970 Monticello, IL 61856
6. Southdown	1. American Southdown Breeders' Association 212 South Allen Street State College, PA 16801

Breed Registries and Associations
(continued)

7. Suffolk	1. American Suffolk Sheep Society 52 North 1st East Logan, UT 84321
	2. National Suffolk Sheep Association Box 324 Columbia, MO 65201

C. Long-Wool Breeds

1. Cotswold	1. American Cotswold Record Association Sigel, IL 62462
2. Leicester	1. None in the United States
3. Lincoln	1. National Lincoln Sheep Breeders' Association Route 1 West Milton, OH 45383
4. Romney (Also, Romney Marsh)	1. American Romney Breeders' Association Department of Animal Husbandry Oregon State University Corvallis, OR 97331

D. Crossbred-Wool Breeds

1. Columbia	1. Columbia Sheep Breeders' Association of America P. O. Box 272 Upper Sandusky, OH 43351
2. Corriedale	1. American Corriedale Association P. O. Box 29-C Seneca, IL 61360
3. Targhee	1. U.S. Targhee Sheep Association Security Bank Building, Box 2513 Billings, MT 59101

Breed Registries and Associations
(Continued)

E. Fur-Type Breed

1. Karakul	1. United Karakul Fur Sheep Registry Box 669 Twin Falls, ID 83301

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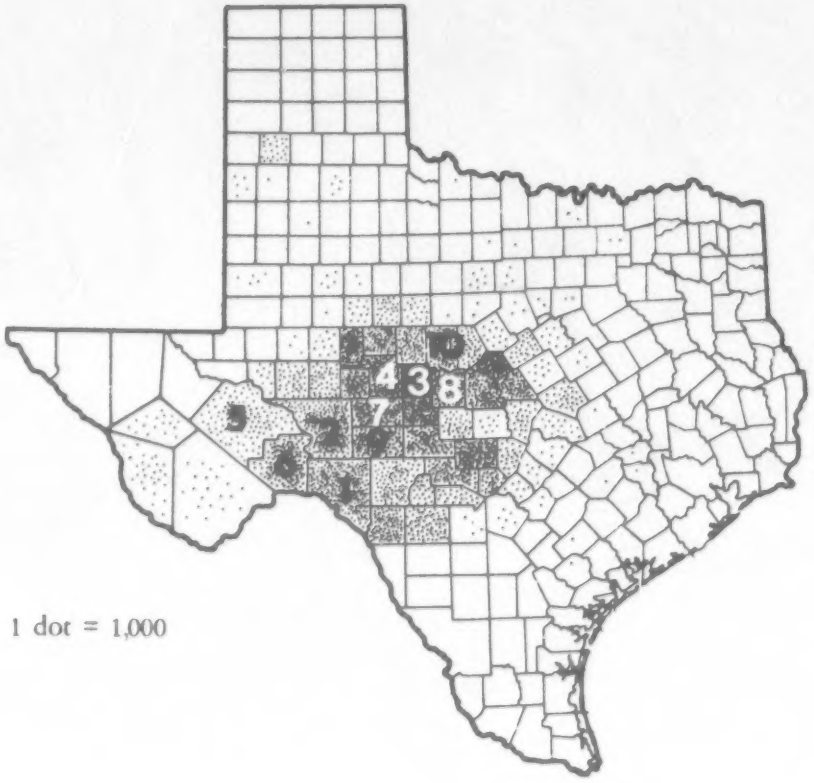
ALL SHEEP
JANUARY 1, 1973



TEN LEADING COUNTIES	1,000 HEAD
1. VAL VERDE	232
2. CROCKETT	211
3. CONCHO	191
4. TOM GREEN	132
5. PECOS	125
6. TERRELL	121
7. SCHLEICHER	115
8. McCULLOCH	111
9. SUTTON	109
10. COLEMAN	96

IN TEXAS 3,214,000

ANIMAL SCIENCE

Unit A: Breeds of Livestock and Poultry

Topic 7: Classes, Breeds, and Varieties of Poultry

*Terms: All terms underlined are included in "Glossary of Terms."

Note: A set of 2 x 2 slides, "Breeds of Poultry, " is available from Vocational Instructional Services.

CHICKENS

A. History of Chickens

Chickens, which were domesticated by man some 5,000 years ago, can be found in every country in the world today. Cockfighting, which has been declared unlawful in many countries, is given credit for the spread of chickens throughout the world. Because of their food value and delicious eating qualities, poultry or poultry products are used in most menus.

Charles Darwin, who studied the evolution of animals, believed that the jungle fowl of India were the ancestors of our domesticated chickens; but Darwin wasn't aware of the structural differences, which poultry authorities believe would indicate a different ancestry. The principal difference is the opening through which the spinal cord passes to the brain of the Asiatic varieties and other varieties. Therefore, it is possible that wild chickens were found and domesticated in several areas of the world about the same time. The different habits of some classes would indicate this; for example, the breeds in the Asiatic class prefer to roost on the ground and lay their eggs on a mound of earth. The habits of other breeds indicate that their ancestors roosted in trees.

Three major factors are responsible for the standardbred chickens we have in the U. S. today:

1. Cockfighting is responsible for developing the vigor and vitality of the present day chicken.
2. The delicious edible qualities of chickens are responsible for our general-purpose breeds, which include all of the standardbred chickens in the American class.
3. In the fifty years between 1870 and 1920, the poultry fancier bred for type and beautiful feathers without regard to egg production. These breeders are responsible for our standardbred chickens of excellent type.

In 1873, the American Poultry Association was organized at Buffalo, New York, in order to protect and promote the standardbred poultry industry. The Association publishes the American Standard of Perfection which describes the varieties, breeds, and classes of poultry. The Standard is issued every five years. New breeds are recognized, and breeds that the Association believes are obsolete are dropped from the Standard. The Association also issues licenses to qualified poultry judges.

B. Importance of Chickens and the Poultry Industry

Today the poultry enterprise is big business in the United States, contributing approximately 8% of the national farm income. The total estimated value of chickens on farms as of January 1, 1971, was $434,729,000. U.S. poultrymen have increased egg production from 56,221,000,000 eggs in 1954, to 66,450,000,000 eggs in 1966, to 71,644,000,000 eggs in 1971. The rate of egg production per hen was increased from 152 eggs in 1954 to 224 eggs per year in 1971.

Broiler producers, also experiencing an increase in production, have cut the time to produce a quality broiler from fifteen weeks to nine weeks; and they are producing these broilers on less feed. The number of broilers, not including general farm production of broilers, has increased from 34,030,000 in 1934 to 2,946,916,000 in 1971.

Transparency No. 1

Poultry and eggs contribute about 7.5% of the average yearly income of Texas farmers. In 1970, Texas ranked 8th among states in number of hens and pullets, 7th in broiler production, and 9th in egg production.

On January 1, 1971, the 17,267,000 chickens on Texas farms were valued at $18,994,000. Broilers were not included in those figures.

Gross income of Texas producers from farm chickens was $5,203,000 in 1970, while gross income from eggs was $90,417,000. The leading counties in numbers of hens and pullets of laying age on January 1, 1973, were Gonzales, Shelby, Fayette, Nacogdoches, Brazos, Camp, Dickens, Dawson, Bexar, and Denton.

Transparency No. 2

Commercial broilers brought a gross income of $90,112,000 in 1972, and the leading broiler producing counties were Nacogdoches, Gonzales, Shelby, Panola, Sabine, San Augustine, Upshur, McLennan, Camp, and Jasper.

C. Classes, Breeds, and Varieties of Chickens

Twelve classes of chickens are listed in the Standard of Perfection. They are the American, Mediterranean, English, Asiatic, Polish, Hamburg, French, Continental, Game and Game Bantam, Oriental, Ornamental Bantam, and miscellaneous classes. Of these, the first four--American, Mediterranean, English, and Asiatic--represent a large percentage of the chickens in the U.S. These are the classes for which breed characteristics will be given.

A class of chickens refers to the area where the breed or variety was developed; for example, the Mediterranean class is composed of breeds which were supposedly developed in the countries bordering the Mediterranean Sea.

A breed of chickens is the term applied to birds in a class. They are similar in body shape and form. Some of the breeds in the American class are Plymoth Rocks, Wyandottes, Rhode Island Reds, and New Hampshire Reds.

The term variety of chickens refers to a subdivision of a breed. These are largely determined by the color of the plumage and differences in the comb.

A strain of chickens, a family name, donating the name of the breeder who developed the strain, is a term used to refer to a particular variety.

The Standard of Perfection lists approximately 200 varieties of chickens, but only about a dozen of these varieties have commercial importance in the U. S. As the poultry industry has developed, less emphasis has been placed on the classes, breeds, and varieties of chickens.

Several factors must be considered in selecting a breed of chickens. An important consideration is the type of product to be marketed and the markets available. Some breeds are superior in egg production, while others excel in meat production, and some rate well in both areas. The successful poultryman then must follow sound judgment in selecting a breed of chickens that is well suited for his enterprise.

The following factors are considered by most poultrymen in selecting a breed or strain:

1. The rate of egg production
2. Mortality rate in the laying house or cage
3. Body size and vigor
4. Egg size and quality
5. Feed conversion

Table 1: Characteristics of the Common Breeds of Chickens

Classes and Breeds	Weight (lbs.)	Comb Type	Color of Ear lobes	Color of Shanks and Toes	Skin Color	Egg Color	Egg Prod. (High, Med., or Low)	Popularity *Most popular within classes
American								
White Plymouth Rock	7½ to 9½	Single	Red	Yellow	Yellow	Brown	Medium	*
New Hampshire	6½ to 8½	Single	Red	Yellow	Yellow	Brown	Medium	
Jersey White Giant	10 to 13	Single	Red	Yellow	Yellow	Brown	Medium	
Rhode Island Red	6½ to 8½	Single and Rose	Red	Yellow	Yellow	Brown	Medium	
Wyandotte	6½ to 8½	Rose	Red	Yellow	Yellow	Brown	Medium	
Asiatic								
Langshan (Black)	7 to 10	Single	Red	Bluish black	White	Brown	Low	*
Cochin	8½ to 11	Single	Red	Yellow	Yellow	Brown	Low	
Brahma (Light)	9 to 11	Pea	Red	Yellow	Yellow	Brown	Low	
English								
Cornish (Dark)	8 to 10	Pea	Red	Yellow	Yellow	Brown	Medium to Low	*
Orpington (Buff and White)	8 to 10	Single	Red	White	White	Brown	Medium	
Australorp	6½ to 8½	Single	Red	Dark Slate	White	Brown	Medium	
Mediterranean								
Leghorn	4½ to 6	Single and Rose	White	Yellow	Yellow	White	High	*
Minorca (White)	6½ to 8	Single	White	White	White	White	Medium to High	
Ancona	4½ to 6	Single and Rose	White	Yellow	Yellow	White	Medium to High	

TURKEYS

A. History of Turkeys

Turkeys, which are one of the few species of poultry native to North America, were domesticated by the Indians in this country and observed by Columbus on his voyage to America in 1492. The early Indians relied extensively upon the turkey for their food.

There are two kinds of wild turkeys, the North American wild turkey and the Ocellated turkey that is native to the Yucatan Peninsula of Mexico. The size of the wild turkey varies from 7 to 9 pounds for the female (hen) and 11 to 13 pounds for the male (tom). Our domesticated turkeys, which originated from the North American wild turkey, weigh from 10 to 30 pounds.

There is only one known breed of turkeys, but there are about fourteen known standardbred varieties within the breed. The most popular varieties are the Broad-breasted Bronze, White Holland, Beltsville Small-Type White, and the Bourbon Red. Approximately 85% of the poults hatched in the U.S. are of the Broad-breasted Bronze variety.

Even though the turkey is a native of the North American Continent, it is regarded as essential for holiday meals in several areas of the world.

B. Importance of the Turkey

There were 128.8 million turkeys raised in the U.S. in 1972; of this number, about 113.8 million were the heavy varieties, which weigh from 15 to 30 pounds, and 15 million were light varieties, which weigh from 10 to 17 pounds.

In order of their production, the leading turkey producing states are as follows: Minnesota, 20.8 million; California, 17.6 million; North Carolina, 12 million; Missouri, 10 million; Arkansas, 8.2 million; Texas, 7.8 million; Iowa, 6.5 million; Indiana, 6.1 million; Virginia, 5.5 million; and Ohio, 4.1 million.

Transparency No. 3

Texas produced 7,851,000 turkeys in 1972. The turkey production in Texas has increased from 104,355,000 lbs. with a gross income of $30,845,000 in 1965 to 160,160,000 lbs. with a value of $33,794,000 in 1972. The ten leading Texas counties in turkey production during 1972 were Bell, Hill, McLennan, Gillespie, Blanco, Eastland, DeWitt, Leon, Brown, and San Saba.

This per capita consumption of turkey in the U.S. increased from 3.6 lbs. in 1947 to 8.5 in 1971.

OTHER FOWLS

A. Ducks

The wild mallard duck (Anas goschas) is the ancestor of all of the domestic breeds

of ducks in the world. It is believed that ducks have been domesticated for a long time since the Romans referred to them more than 2,000 years ago. Commercial duck raising has probably been practiced longer in China than in any other country, but duck raising is practiced extensively in Belgium, Holland, and other parts of Europe. Duck producers in Europe place more emphasis on egg production, while in the U.S. producers emphasize conformation and fleshing qualities.

Duck raising in the U.S. has remained constant, and five states--New York, Michigan, Illinois, Wisconsin, and Massachusetts--produce about half of the nation's ducks. Duck production is concentrated in these states because of the demand for ducks by their foreign population.

Duck breeds are divided into two distinct types, the meat type and the egg type. The most popular breeds in this country are meat type; however, the egg production of some flocks in the European countries exceeds the egg production of our better managed flocks of chickens.

B. Geese

The goose was the first bird to be domesticated and was a sacred bird in Egypt 4,000 years ago. The breeds of geese in the U.S., originated from the wild gray goose. Most of the U.S. geese production is concentrated in the North Central states, where the principal demand is for goslings, which weigh about 12 pounds at 12 weeks of age. There are seven breeds of geese, with the more popular breeds being listed in this topic.

C. Guineas

The guinea, raised in limited quantities in the U.S., orginated in Africa where wild guineas exist today. The guinea has been domesticated and spread around the world.

Guinea meat is dark and is substituted by some hotels and restaurants for other game birds. Less than one million guineas are raised in the U.S. annually, with most of the present production being on small farms where they are used as guardians for other poultry. At the least disturbance, the guinea will make a harsh cry.

Table 2: Classes and Varieties of Turkeys, Ducks, Geese, and Guineas

Classes and Varieties	Origin	Growth	Weight at 28 weeks	Color of Legs and Toes	Color of Plumage	Egg Production
A. Turkeys						
Broad-breasted bronze	Northwest U.S.	Rapid	Toms--25 to 28 lbs. Hens-- 15 to 16 lbs.	Dull black with grayish white	Copperish bronze, dull black	Fair
White Holland	Europe	Rapid	Toms--23 to 33 lbs. Hens-- 14 to 18 lbs.	Pinkish white	White	Good
Beltsville Small-Type	United States	Rapid	Toms--12 to 17 lbs. Hens-- 7 to 10 lbs.	Pinkish white	White	Very good
Bourbon Red (Other standardbred varieties are Narragansett, Black, and Slate.)	Kentucky	Rapid	Toms--23 to 33 lbs. Hens-- 14 to 18 lbs.	Reddish pink in adults, deep reddish horn in young turkeys	Chestnut mahogany; each feather has narrow, black edging.	Fair
B. Ducks			Mature Weight			
Egg Breeds						
Runner (Three Varieties: Fawn and white, White, and Penciled)	East Indies	Fair	4 to 4½ lbs.	Fawn and White: orange-red White: orange Penciled: orange red	Penciled, fawn white	Good
Buff	England	Fair	6 to 8½ lbs.	Orange yellow	Rich, fawn-buff Drake's head and neck seal-brown	Good

Classes and Varieties	Origin	Growth	Mature Weight	Leg and Toe Color	Plumage Color	Egg Prod.
Meat Breeds						
Pekin	China	Good	8 to 9 lbs.	Reddish orange	Creamy white	Fair
Cayuga	New York	——	7 to 8 lbs.	Dark slate	Greenish black	----
Aylesbury	England	----	8 to 9 lbs.	Bright, light orange	Pure white	----
Rouen	France	----	8 to 9 lbs.	Dark brown and dusky orange	Mahogany brown, dark brown with greenish sheen	----
Muscovy	South America	----	7 to 9 lbs.	Yellow to dark lead	Greenish black, black broken with white	----
C. Geese						(Egg production per year)
Toulouse	France	----	16 to 20 lbs.	Deep, reddish orange	Dark gray on back, light gray on breast, almond white on abdomen	25 to 40
Emden	Germany	----	16 to 20 lbs.	Deep orange	Pure white	35 to 50
Chinese (Two varieties: Brown and White)	China	----	8 to 12 lbs.	Brown: orange White: orange to yellow	Brown: same White: same	40 to 60
African	India	----	16 to 20 lbs.	Dark orange	Ash brown on back and wings, light ash brown on neck, breast, and underside of body	30 to 40
D. Guineas						
(Three varieties)	North Africa	----	2 to 3 lbs.	----		
Pearl					Purplish-gray, dotted or pearled with white;	
White					White;	
Lavender					Lavender	----

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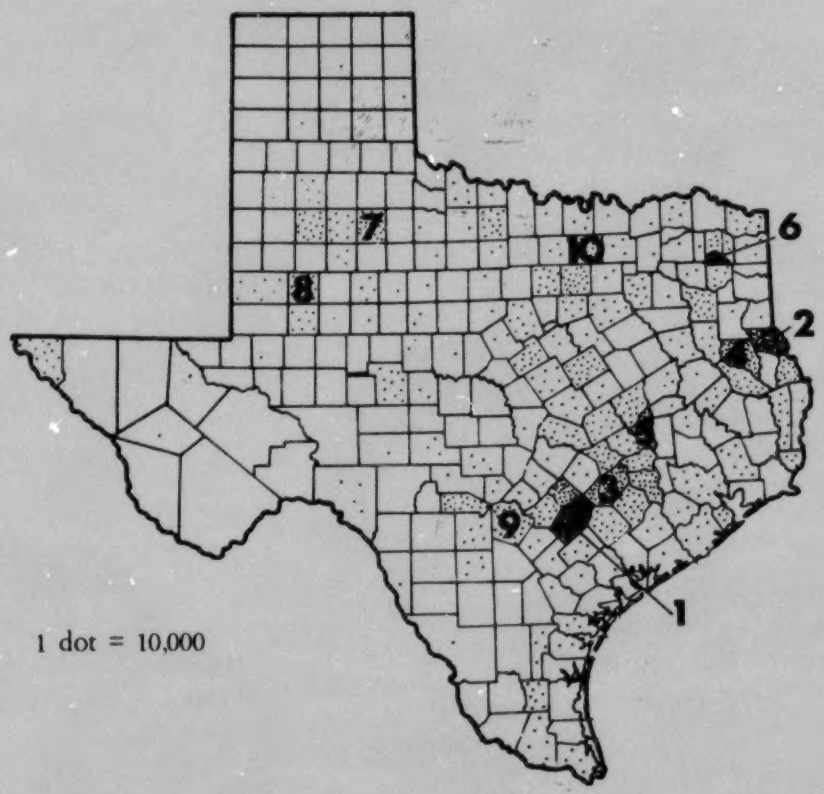
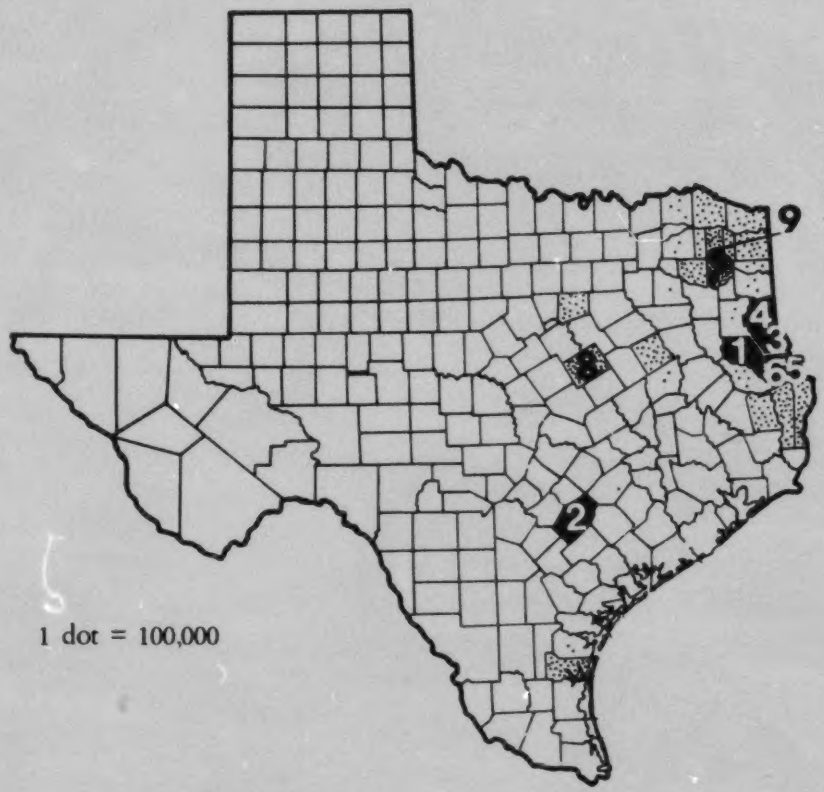
HENS AND PULLETS OF LAYING AGE
JANUARY 1, 1973



TEN LEADING COUNTIES	1,000 HEAD
1. GONZALES	1,669
2. SHELBY	903
3. FAYETTE	525
4. NACOGDOCHES	417
5. BRAZOS	388
6. CAMP	353
7. DICKENS	265
8. DAWSON	244
9. BEXAR	243
10. DENTON	234

IN TEXAS 11,950 000

COMMERCIAL BROILERS PRODUCED IN TEXAS 1972

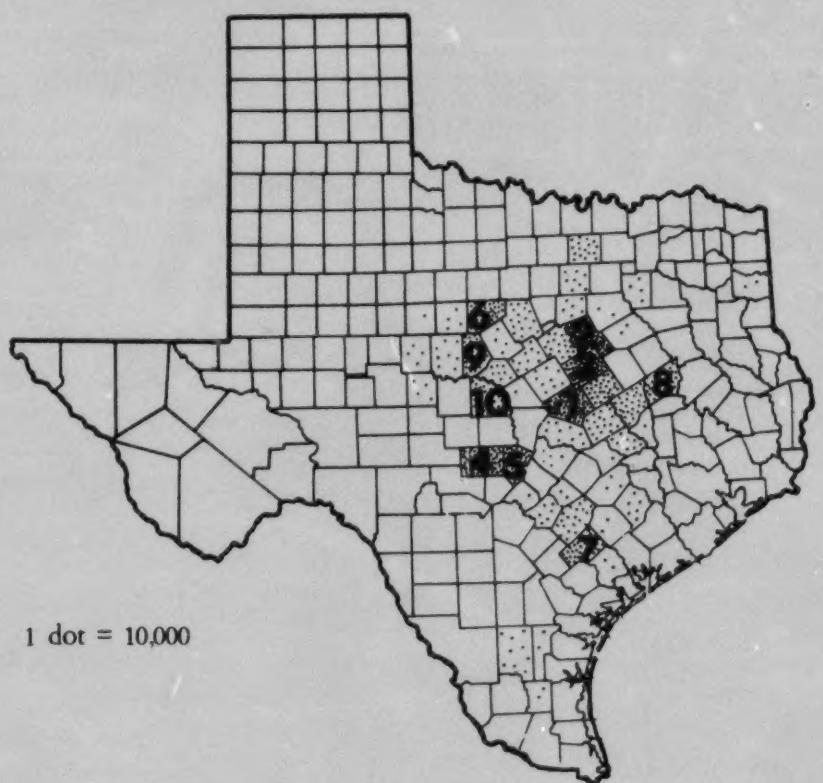


TEN LEADING COUNTIES

	1,000 HEAD
1. NACOGDOCHES	35,873
2. GONZALES	33,389
3. SHELBY	32,214
4. PANOLA	16,035
5. SABINE	12,686
6. SAN AUGUSTINE	11,245
7. UPSHUR	4,875
8. McLENNAN	4,864
9. CAMP	2,513
10. JASPER	2,441

IN TEXAS 2,996,058,000

TURKEY PRODUCTION IN TEXAS 1972



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TEN LEADING COUNTIES	1,000 HEAD
1. BELL	835
2. HILL	671
3. McLENNAN	669
4. GILLESPIE	606
5. BLANCO	429
6. EASTLAND	409
7. DE WITT	370
8. LEON	338
9. BROWN	325
10. SAN SABA	306

IN TEXAS 128,808,000

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 8a: Selecting Beef Cattle

*Terms:

Note: Since many of the same factors should be considered by all livestock producers, regardless of the class of animals produced and the type of production, the areas "Determining the Type of Producer" and "Selecting a Breed" are covered in Topic 10a only.

I. Determining the Type of Producer

Prior to selecting beef animals, one must determine the method or type of operation he will use to produce beef. There are three principal types of producers: breeder cattle producer, commercial cow-calf producer, and slaughter cattle producer. Several factors will determine the method or methods a producer selects.

Factors to consider and a brief explanation of each type of production follow:

A. The breeder producer produces breeding stock for other breeders and the commercial cow-calf producer. Before deciding to become a breeder cattle producer, a rancher should consider the following factors:

Transparency No. 1

1. Breeder cattle production requires much more capital than commercial cow-calf production.
2. Breeder cattle production requires more equipment and labor than other types of beef production.
3. Years of breeding are required to establish a reputation for breeding quality cattle; the breeder producer must have patience.
4. The breeder producer must be able to anticipate the demand for cattle, both as to type and number.
5. The breeder producer must be a proficient breeder or hire a proficient breeder.
6. Very few breeders become master breeders.

However, there is the possibility that a person may become a noted and successful master breeder.

B. The objectives of a commercial cow-calf producer are to have each cow to produce a calf annually, at a weight and age that is desirable to the market, and to receive the greatest return on his labor and investment. He may sell his calves at weaning as slaughter calves or as feeder calves to a slaughter cattle producer. Beef cattle specialists conducting beef production research have determined that good management is required to produce an annual profit of $30.00 per cow; however, some producers receive a greater return.

The commercial cow-calf producer may enjoy some special advantages in the production of feeder calves, but one must consider both the favorable and unfavorable factors relative to entering this type beef enterprise.

Transparency No. 2

Factors Favorable to Commercial Cow-Calf Production are:

1. Commercial or grade cattle require a smaller investment per animal unit than purebred cattle, and they generally require less investment in buildings and equipment.
2. Commercial cattle generally require less labor for their care than purebred cattle.
3. The cows can be maintained on lower-grade roughages and pasture with less need for supplemental feeding of grain and other more costly commercial feeds.
4. A commercial cow-calf program can be adapted to land areas not suitable for the production of crops or high yielding forages.
5. Less short-term risk is involved than in a slaughter cattle feedlot operation.

Factors that may be Unfavorable to Commercial Cow-Calf Production are:

1. The price fluctuation in market cattle is usually greater than for breeder cattle.
2. High-quality purebred bulls are usually excessively high and difficult to obtain.
3. Replacement cattle particularly in a crossbreeding program will require the breeder to maintain more than one herd of breeding cattle.

C. The slaughter cattle producer tries to produce slaughter cattle at a desirable finish in the shortest possible time. Dry lot fattening, pasture fattening, and a combination of the two are methods used by the slaughter cattle producer to finish cattle.

The following factors should be considered by the prospective slaughter cattle producer:

Transparency No. 3

1. A large amount of capital is required to buy feeders. Slaughter cattle production is a volume business.
2. There must be an adequate feeder cattle supply available.
3. Adequate facilities for handling cattle must be provided.
4. Large quantities of feed must be available at a price that the producer can pay and still make a profit.
5. The slaughter cattle producer must be an efficient feeder.
6. There must be a demand for the grade of slaughter cattle produced.
7. The slaughter cattle producer's margin of profit is small.

In addition to considering the above factors, the slaughter cattle producer using pastures to fatten cattle must provide adequate grazing.

II. Selecting a Breed of Cattle

A rancher should consider the following factors when selecting a breed of cattle:

Transparency No. 4

1. Personal preference likely will determine the breed with which the breeder may experience greatest success.
2. The availability of the breed in the community and area will determine the breeder's source of supply.
3. Environmental conditions including climate, grazing, disease, and insect and parasite problems
4. Demands for the breed from other purebred and commercial breeders
5. Cost of establishing the herd

There are two kinds of breeder cattle producers, the purebred breeder and the crossbred breeder.

III. The Selection of Individual Animals

Selection, based on several factors, is the only method a rancher has of improving beef cattle. Regardless of the method used to produce beef, the producer must constantly buy, sell, and cull animals in his herd. It is estimated that an average of 20 percent of a breeding herd is replaced each year, with the older and non-producing animals being replaced with younger animals. If the breeder or commercial cow-calf producer culls at this rate, he will have a new herd every five years.

Components that should be considered are conformation, age, production, and pedigree.

A. Conformation as a Basis for Selecting Beef Animals

The ultimate objective in producing beef is that of selling meat to the consumer. Thus, fads or fancies that stray too far from this objective will eventually bring a penalty.

Transparency No. 5

Prior to properly selecting beef animals based on conformation, an individual must first know the parts of a beef animal.

Transparency No. 6

After the person has learned the parts of a beef animal, he must then become familiar with the wholesale cuts of meat and the areas of the carcass where they are located. The beef animal having desirable conformation should yield a large percentage of rib, loin, and round. Animals with desirable type or conformation will possess desirable muscling and finish. The forequarters, brisket, plate, belly, and flank yield the low priced cuts and constitute the areas of greatest waste and should make up as small a percentage of the carcass as possible.

Transparency No. 7

After the individual has become familiar with the parts of the beef animal and the wholesale cuts of meat and their location on the carcass, he should develop a mental picture of the ideal or model live animal which will produce the most and highest quality meat.

From the standpoint of the producer, under practical farm and ranch conditions, functional efficiency is extremely important. This is to say, for example, that a large barrel capacity is directly related to efficiency of feed conversion and milking ability, or that a smaller cow requires a lesser maintenance cost than a large cow. Thus the most profitable animals will be those that strike a happy medium between conformation or type, as related to the maximum production of a high-quality product, and the efficiency of production of this product.

In selecting beef cattle, keep in mind that the show type should be the most useful commercial type. The standards in the show ring are the results of the tireless efforts of breeders who comply with the exacting demands of the consumer of beef and with the rigid requirements of cattle producers. Therefore, the selection should be made with greatest emphasis on the utility values in beef production.

When selecting beef animals, one should follow a definite order of inspecting animals, and this order should be used each time a person selects animals. The following order of inspection has been recommended for selecting beef cattle: Step I, sideview; Step II, rear view; Step III, front view; and Step IV, contact step. The animal is observed from approximately 20 feet in the first three steps; and close inspection of the animal is made in step four.

Transparency No. 8

From the sideview—
Steer number 1 is a light framed steer that is very upstanding and shallow bodied; is light in the rear quarters; is lacking in balance and quality; and shows a lack of muscling and is under finished.

Steer number 2 approaches the ideal in that he exhibits balance and style; has good length of body with a long, full loin and rump and a deep bulging hindquarter; shows extreme muscle development through the arm and forearm region; is trim in the flanks, middle, and brisket; is correct in finish; and stands on ample legs that are correctly placed under the body.

Steer number 3 is a short-bodied steer that is short of leg; is a deep-bodied wasty steer; is an unbalanced, heavy-fronted steer that has a wasty brisket, rear flank, and cod; is over finished; and exhibits only average muscling.

Transparency No. 9

Comparing the carcasses of these three steers from the sideview—

Steer number 1 shows a lack of muscling and finish; is a light-framed steer; and lacks the style and quality of a high grading market steer.

Steer number 2 exhibits desirable length of body with a long, level loin and rump; shows evidence of heavy muscling through the shoulder, loin, and rear quarter with a deep bulging round; carries the correct amount of finish; and would cut out a high percent of the primal cuts (loin, rib, and round).

Steer number 3 demonstrates an unbalanced, heavy-fronted carcass that is too short of body and is wasty in the brisket, middle, and flanks; lacks desirable muscling; is light in the hindquarter; is over finished; and therefore, would cut out a low percentage of primal cuts.

Step I—side view: Viewing the animal from the side, the neck should be moderately short and trim; the back along the topline should be long and level from the top of the shoulder extending through the rump; the round should be deep, wide, and bulging through the stifle; the rear flank and underline should be trim; the forequarter should be well-muscled with a large forearm; the brisket should be clean and trim; and the animal should stand on ample legs that are correctly placed under its body.

Step II—rear view: Viewing the animal from the rear, good balanced width is desirable with fullness in the fore ribs, across the loin and back, and over the rump; the back and loin should be well-muscled throughout with maximum width in the thighs about midway between the tail and the hock with extreme bulge through the stifle; also, the animal should stand squarely on his rear legs and should walk with ease.

Step III—front view: Viewing the animal from the front, the legs are correctly set and well-muscled in the arm and forearm; the shoulders taper slightly toward the top, but exhibit balance, fullness, and good muscling; the brisket is clean and trim.

Step IV—contact step: Close inspection of the animal is observed in this step. The degree of finish may be determined by examining the animal as a whole, but it is often checked by pressing the hand on several parts of the body for closer examination.

Patches of fat, which often occur over the ribs, rump, and back are very objectionable. Proper finish is indicated by a firm uniform covering over the entire body. When the finish is lacking, it feels hard and flat.

One should remember that conformation is only one factor to consider in selecting livestock. Since conformation and other characteristics are inherited, several factors should be used as a basis of selection. Visual appraisal is important, but it is only an estimate. An animal may inherit conformation but not gaining ability. Muscling and the proportion of lean to fat are two inherited characteristics that cannot be determined by visual appraisal.

Transparency No. 10

From the frontview—

Steer number 1 shows a lightness of bone and frame; is narrow in the shoulders and legs; and is lacking in muscling and desirable fleshing.

Steer number 2 exhibits wide, well-muscled shoulders and a clean, trim brisket; shows balance and evidence of correct fleshing; and legs are correctly set.

Steer number 3 carrying excessive fat (which is visible in the brisket and over the back and shoulders) is extremely wasty; and is lowest and short legged, lacking the size, scale, and muscling of the number 2 steer.

Transparency No. 11

From the brisket cross section view—

Steer number 1 is narrow and shows little marbling which indicates low yield and probable low tenderness.

Steer number 2 shows desirable muscling and marbling; trim in the brisket.

Steer number 3 demonstrates little muscling and is extremely fat and wasty.

Transparency No. 12

From the rear view—

Steer number 1 is light of bone and frame; shows little evidence of muscling in the stifle and round; and does not carry adequate finish for a high grading steer.

Steer number 2 possesses highly desirable muscling indicated in the thickness of stifle and round blending into a rounded top at the tail head; stands correctly on legs of ample bone and size; and is uniform and correct in finish.

Steer number 3 is blocky, flat backed, and slab sided indicating an over-fat wasty individual; is extremely low-set; and lacks desirable muscling.

Transparency No. 13

From the round cross section view—

Steer number 1 shows a lack of marbling usually indicating undesirable, tough beef. His narrowness of frame also indicates low yield.

Steer number 2 exhibits a highly desirable degree of muscling, marbling, and size indicating high yield. He also carries a desirable finish.

Steer number 3 is extremely wasty and slight of muscling and shows the fat deposit found in flat, wide-backed beef animals which is undesirable.

There are numerous conformation defects which may be found in beef animals. Some are present at birth while others appear with age. It is necessary to recognize the correct conformation and to select animals which transmit it as well as having ancestors which are correctly conformed. Straight, large boned, upstanding individuals are capable of moving about and traveling distances to graze whereas bad legged animals may not be able to do so; thus they are uneconomical.

Transparency No. 14

From the front, beef animals should have adequate width and capacity through the chest with the front legs spaced wide apart and properly set.

Steer number 1 illustrates the front legs and feet turned in, which is known as "pigeon-toed."

Steer number 2 shows correct legs.

Steer number 3 shows the feet and legs turned out with the knees knocked, which is known as "splayed."

Transparency No. 15

From the rear beef animals should show maximum width through the lower round and stifle and the hind legs should come down straight out of the body with the proper set.

Steer number 1 shows the back legs turned out, indicating weakness of legs.

Steer number 2 shows correct legs.

Steer number 3 shows the hocks turned in, which is known as "cow-hocked," and the feet set up under the body known as "sickle hocked."

Transparency No. 16

The best place to observe bone substance on a beef animal is the "cannon bone area" of the front leg (Figure 1). The cannon bone extends from the knee down to the pastern joint. It is generally thought that cattle with large-sized cannon bones are big framed and heavy muscled. However, there is as much variation of individual animals within a breed as there is between breeds for bone size characteristics.

Cattle with improper "set" to their legs will have more problems, especially under conditions of stress, such as breeding or under heavy weight conditions. For a proper set to the feet and legs, a plumb line straight down from the pin bone at the point of the animal's buttocks should intersect the hock and dewclaw of the rear leg (Figure 2).

If the animal is too heavy for his bone size, a "sickle hocked" condition in his hind legs may result (Figure 3). The weight forces the feet under the body, putting more strain on the muscles and bones of the stifle joint and the hip and leg region.

"Post-legged" or the condition of too little curvature in the hind legs (Figure 4) seems to be a heritable trait, especially prevalent in fine boned cattle. The "post-legged" condition is undesirable because animals put more pressure on the stifle joint with less chance for absorption of the strain over a larger area. This condition sometimes results in torn ligaments and tendons.

Correct legs, length of body, size, depth of body, and muscling are apparent at an early age. These characteristics are highly heritable. Correct udder attachment, and development, number, and spacing of teats in cows, and testes and sheath development in bulls are less apparent until sexual maturity. These characteristics are of extreme importance in the cow-calf operation. (When breeding stock are selected at a young age, it is very necessary to study ancestors.)

B. Age as a Basis for Selecting Beef Cattle

Generally, age will determine the number of calves a breeding animal can produce and the class of a slaughter animal.

Transparency No. 17

The longer a cow can be kept in the herd, without sacrificing production, the more the animal can contribute to the breeding of the herd, and fewer replacements will be required. The selection of mature cows, four to eight years of age, is considered to be the best buy. Based on sex, cattle are classified as steers, heifers, heiferettes, cows, bulls, and stags; and slaughter cattle are graded as prime, choice, good, standard, commercial, utility, cutter, and canner. Cattle are also classified according to age: calves, yearlings, two-year-olds, cows, bulls, and stags.

C. The Pedigree as a Basis of Selection

The pedigree is an important factor in selecting animals, that is, if the selection is based on the ancestors that are "close-up" in the pedigree. Using the performance of the ancestors should be the principal factor to consider in basing the selection on pedigree. There is a tendency for a bloodline to become a fad. The breeder using the bloodline as a basis for selection should not fall into the "fad trap."

Stockmen are aware that animals differ in economically important traits such as birth weight, weaning weight, daily rate of gain, body type, etc., which are affected by both heredity and environment. If improvement in an economically important trait is due to an improved environment, the heritability of that character will be low and little progress can be made through selection. However, if the trait is highly heritable, marked progress can be made through selection. There is a need, therefore, to know the approximate amount or percentage of change due to heredity.

The following chart from the U.S.D.A. gives the percent of heritability characteristics, which are important factors in selecting animals.

Transparency No. 18

HERITABILITY ESTIMATES FOR BEEF CATTLE CHARACTERS

Character	*Approximate Heritability of Character in Percent
Birth weight	45%
Weaning weight	26%
Weaning conformation score	32%
Daily rate of gain from weaning to marketing	46%
Efficiency of feed utilization	39%
On-foot grade at slaughter time	38%
Carcass grade	39%
Area of rib eye	70%
Reproductive performance	25-30%
Cow maternal ability (Mothering ability and milk production)	30%
Tenderness	50%+
Fat thickness	32%
Carcass yield	35%
Yield of retail cuts	35%

* Levels of heritability and genetic correlations may be interpreted as follows:

Very High	.60 and over
High	.50 to .60
Medium to High	.40 to .50
Medium	.30 to .40
Low to Medium	.20 to .30
Low	.10 to .20
Very Low	.00 to .10

There are many bloodlines or families within a breed, and animals of certain bloodlines have certain characteristics which can be recognized by some breeders. The inexperienced breeder should determine the bloodline(s) he is going to purchase and breed within the selected bloodline; however, experienced breeders have been successful crossing bloodlines.

The bloodline of the bull is more important than that of the cows, for his bloodline will be distributed to all the offspring. It is generally believed that cows having the same bloodline will produce a higher percentage of good calves; however, some breeders believe a good herd sire will nick with most any bloodline.

For those interested in producing purebred cattle, the registration paper is only as good as the breeder's reputation. Breeding stock should be purchased from reputable breeders. Also, the registration paper only gives the animal's ancestry and not any assurances of economical beef production.

D. Production Testing as a Basis of Selection

Production testing is the most infallible basis of selection, particularly for selecting young herd sires. Production testing embraces both (1) Individual Merit Testing and (2) Progeny Testing.

Individual Merit Testing (or Performance Testing) is the practice of evaluating and selecting on the basis of the animal's individual merit.

Progeny Testing is the practice of selecting animals on the merit of their progeny (offspring).

To keep accurate records, the breeder must make positive identification of each animal and its offspring. This may be done by fire branding, by using neck chains or ear tags, or by tattooing the animal's ear.

In order to be most effective, selection by production testing must be based on characteristics of economic importance and high heritability, and an objective measure such as pounds, inches, etc. should be placed on each of the traits measured. Those animals that fail to meet the standards set forth should then be removed from the herd.

Many of the beef cattle breed associations have initiated programs for recording production records on individual animals, and also on herds within the breed. Several breed associations and also private processing centers offer data processing equipment for cattle breeders who are interested in keeping complete records on their herds.

Transparency No. 19

Example production form for recording "Calf and Yearling Weights and Grades"

Transparency No. 20

Example production form for recording "Sire's Annual Production Record of Dam"

Example production form for recording "Lifetime Production Record of Dam" (cows)

The above forms are examples of records being used by ranches who are production testing their herds.

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1. Ensminger, M. E., Beef Cattle Science, Fourth Edition, The Interstate Printers and Publishers, Danville, IL, 1968.

2. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1968.

3. "Using Data Processing Equipment to Keep Beef Cattle Production Records," B-978, Texas Agricultural Extension Service, Texas A&M University, College Station, TX.

4. "Livestock Judging and Evaluation," Bulletin AS-388, Animal Sciences Department, Cooperative Extension Service, Purdue University, Lafayette, IN.

5. "Judging Slaughter Steers," B-1026, Texas Agricultural Extension Service, Texas A&M University, College Station, TX.

FACTORS TO BE CONSIDERED BY PROSPECTIVE BREEDER CATTLE PRODUCERS

1. CAPITAL REQUIRED

2. EQUIPMENT AND LABOR REQUIRED

3. TIME REQUIRED

4. FUTURE DEMANDS

5. BREEDING PROFICIENCY

6. NUMBER OF MASTER BREEDERS

FACTORS FAVORABLE TO COMMERCIAL COW-CALF PRODUCTION

1. SMALLER INVESTMENT PER ANIMAL UNIT

2. LESS LABOR REQUIRED

3. LOWER LEVEL OF NUTRITION REQUIRED

4. ADAPTABLE TO LESS PRODUCTIVE LAND AREAS

5. LESS SHORT TERM RISK INVOLVED

FACTORS UNFAVORABLE TO COMMERCIAL COW-CALF PRODUCTION

1. SUBJECT TO GREATER PRICE FLUCTUATION

2. HERDBULLS USUALLY EXPENSIVE

3. BREEDING PROGRAM MAY REQUIRE MULTIPLE HERDS

FACTORS TO BE CONSIDERED BY PROSPECTIVE SLAUGHTER CATTLE PRODUCERS

1. CAPITAL REQUIRED

2. FEEDER CATTLE SUPPLY

3. HANDLING FACILITIES

4. AVAILABLE FEED SUPPLY

5. FEED EFFICIENCY

6. SLAUGHTER CATTLE DEMAND

7. PROFIT MARGIN

FACTORS TO CONSIDER WHEN SELECTING A BREED OF CATTLE

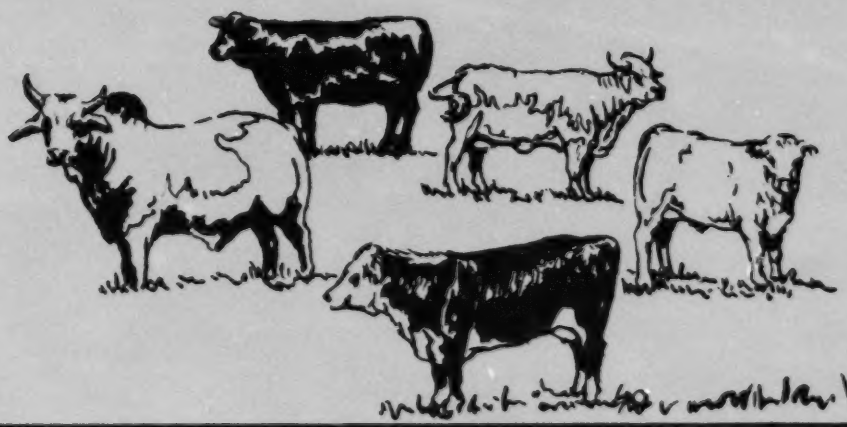
1. PERSONAL PREFERENCE

2. AVAILABILITY OF BREED

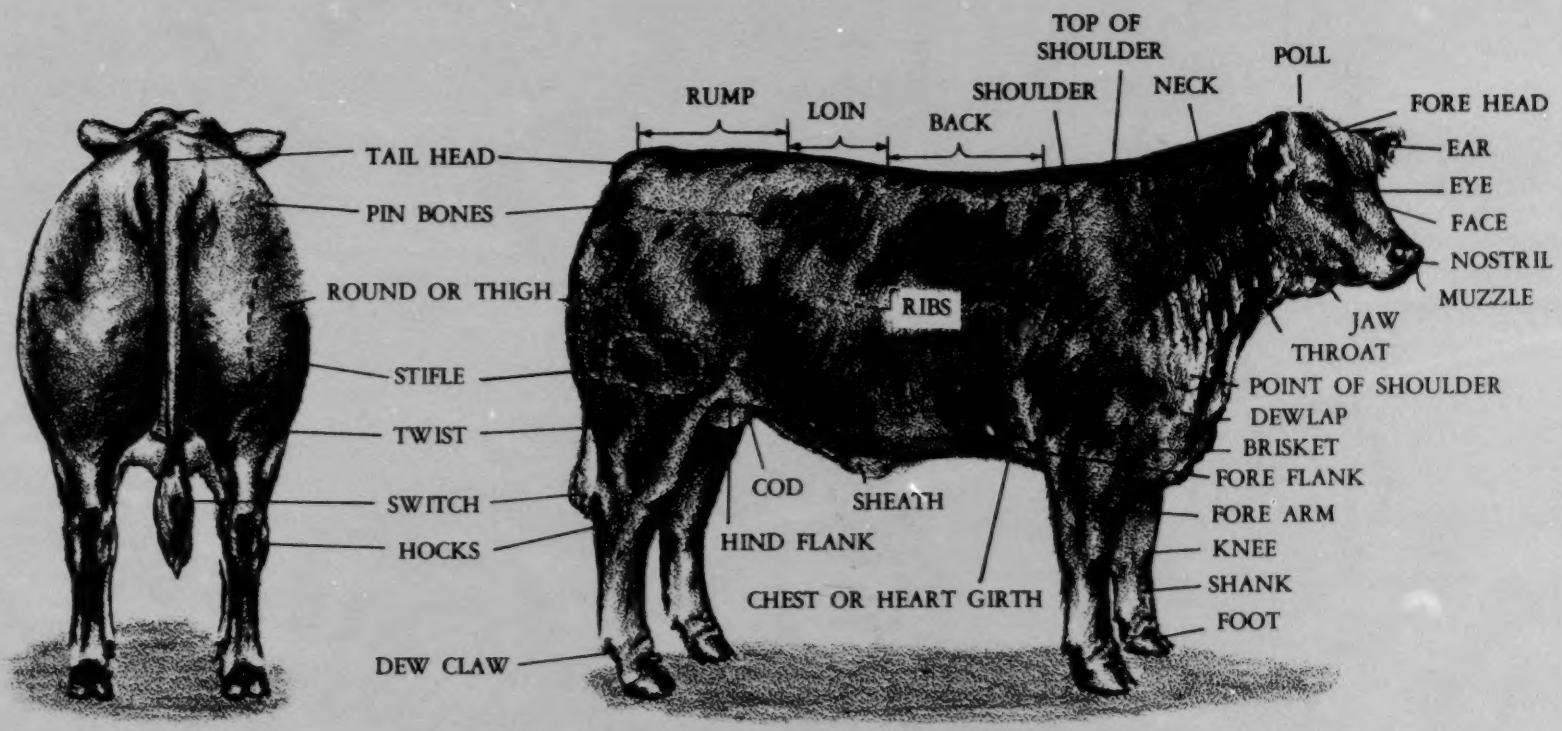
3. ENVIRONMENTAL CONDITIONS

4. DEMANDS FOR THE BREED

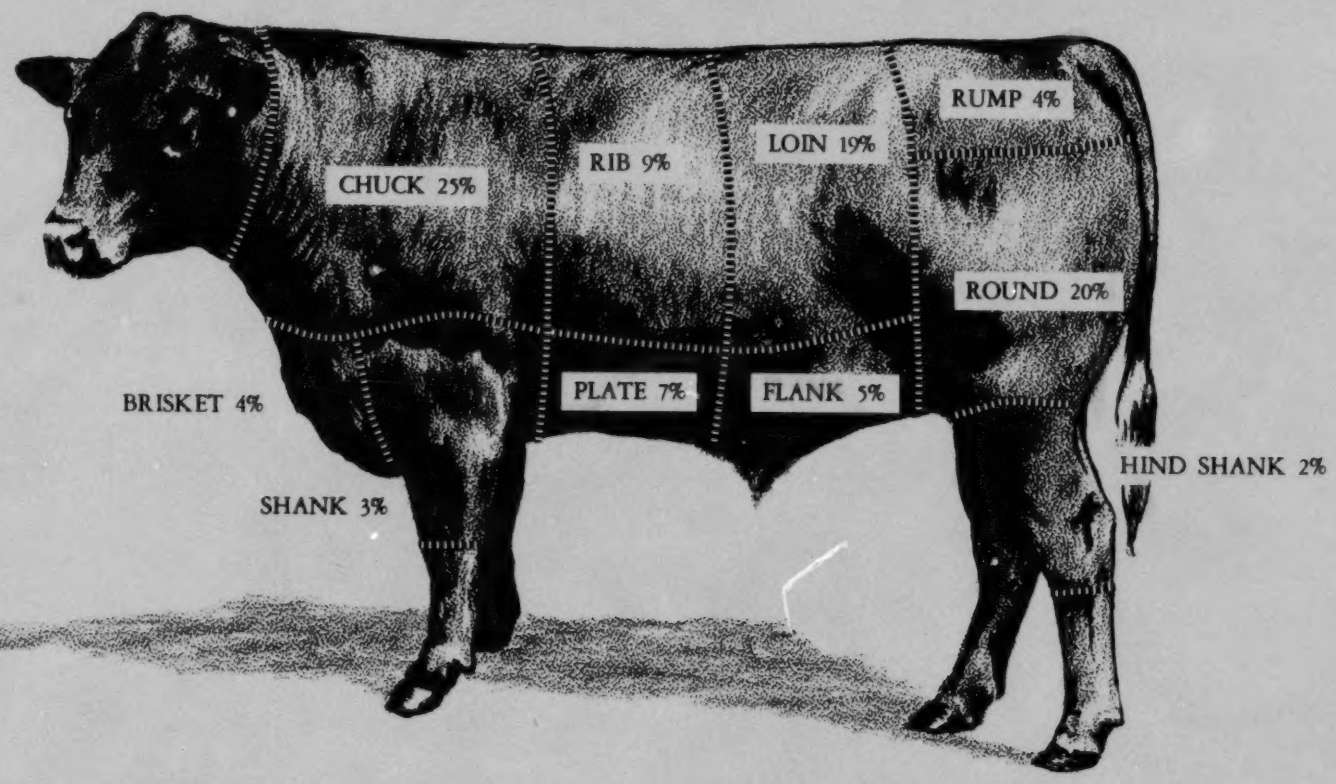
5. COST OF ESTABLISHING THE HERD



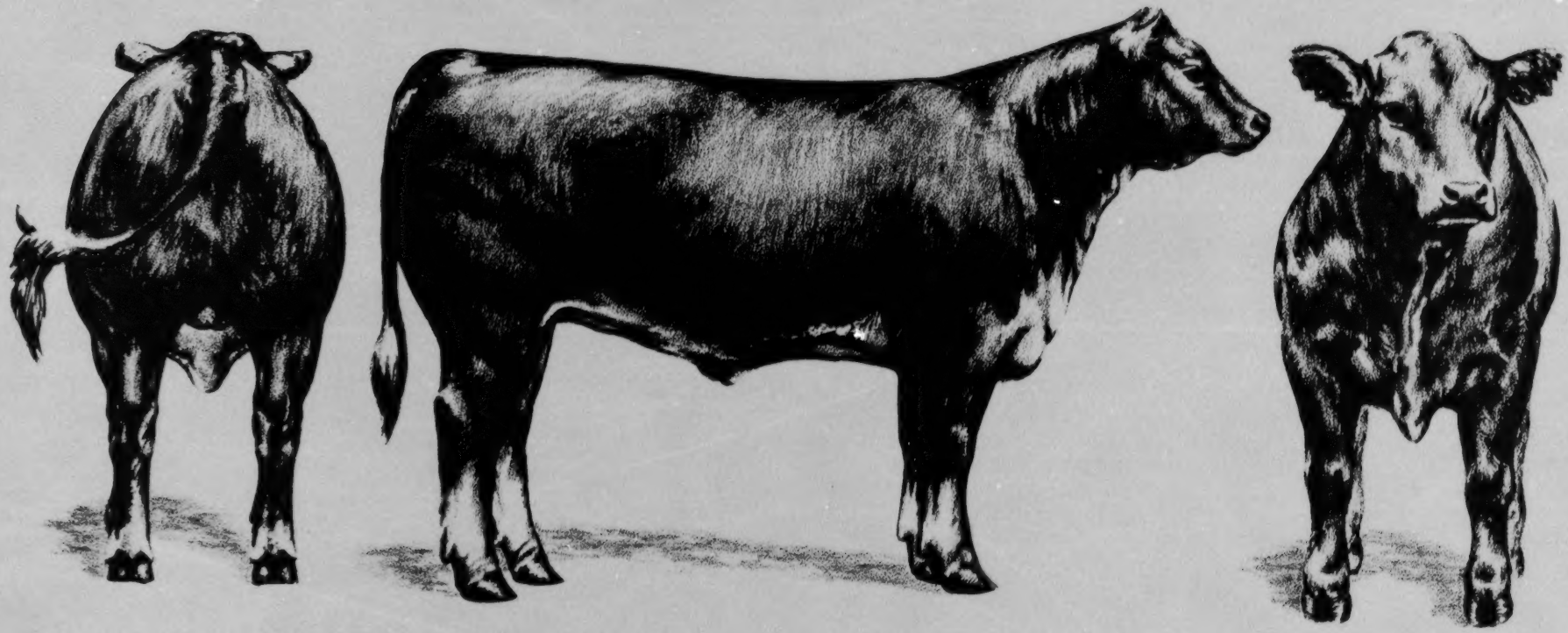
PARTS OF A BEEF ANIMAL



WHOLESALE CUTS OF BEEF



IDEAL BEEF CONFORMATION



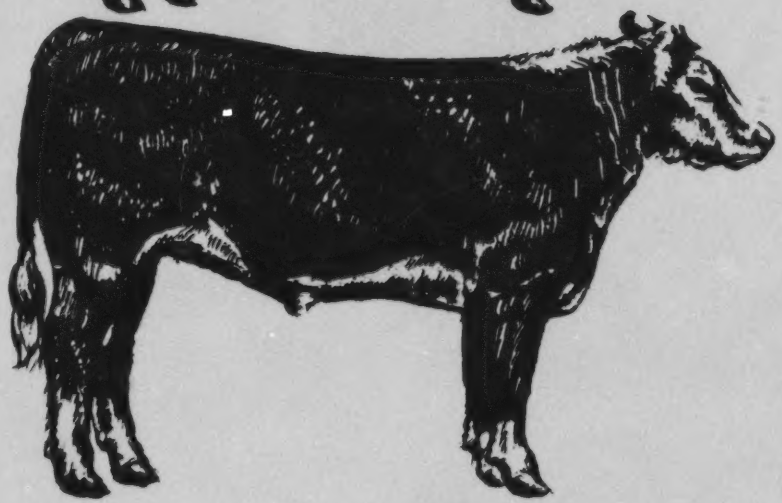
REAR VIEW

SIDE VIEW

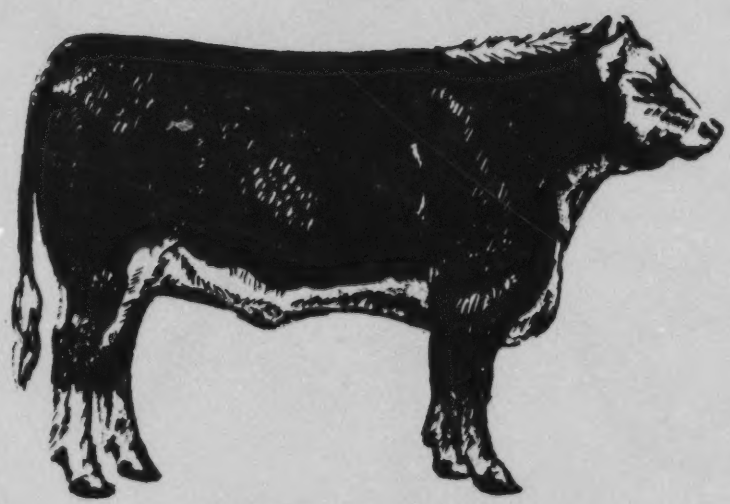
FRONT VIEW

COMPARISON OF LIVE STEERS
(SIDE VIEW)

STEER 1

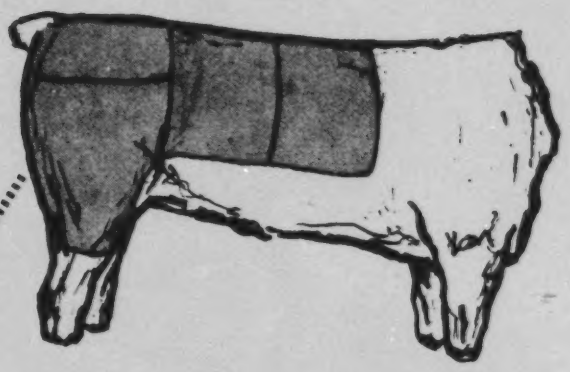


STEER 2



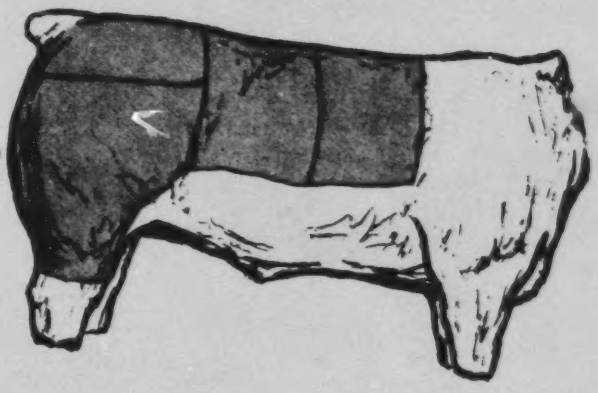
STEER 3

COMPARISON OF STEER CARCASSES
(SIDE VIEW)

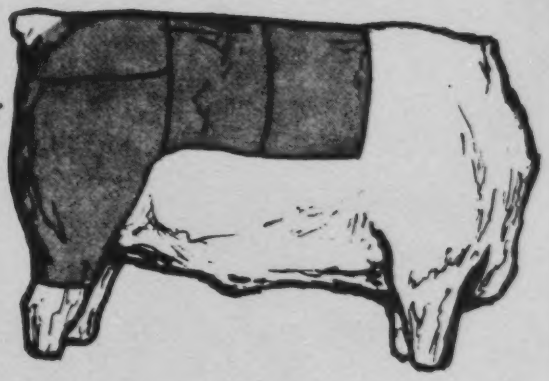


STEER 1

area of primal cuts



STEER 2



STEER 3

COMPARISON OF LIVE STEERS
(FRONT VIEW)

STEER 1	STEER 2	STEER 3

CROSS SECTION OF STEER CARCASSES
(FRONT VIEW)

STEER 1

STEER 2

STEER 3

COMPARISON OF LIVE STEERS
(REAR VIEW)

STEER 1 | **STEER 2** | **STEER 3**

CROSS SECTION OF STEER CARCASSES
(REAR VIEW)

STEER 1

STEER 2

STEER 3

V-A-1

II-A-8a
No. 13

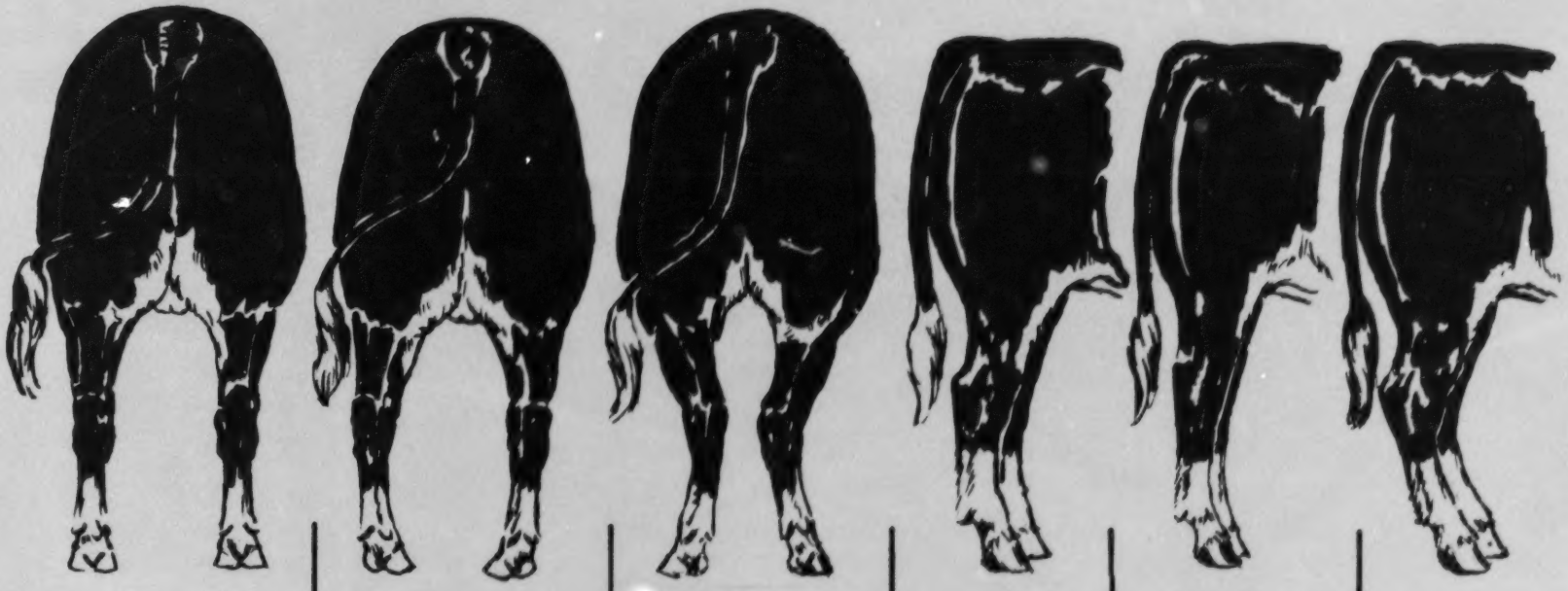
COMPARISON OF CORRECT WITH DEFECTIVE FRONT LEGS

CORRECT | SPLAY FOOTED | TOED IN | CORRECT | CALF KNEED | BUCK KNEED

V-A-1

II-A-8a
No. 14

COMPARISON OF CORRECT WITH DEFECTIVE HIND LEGS



CORRECT | OUT IN THE HOCKS | COW HOCKED | CORRECT | POST LEGGED | SICKLE HOCKED

V-A-1

II-A-8a
No. 15

SUBSTANCE OF BONE AND SET OF LEGS AND FEET

Fig. 1

Fig. 2

Fig. 3

Fig. 4

CLASSIFICATION OF CATTLE BASED ON SEX

STEERS	HEIFERS	HEIFERETTES
COWS	BULLS	STAGS

SLAUGHTER CATTLE GRADES

PRIME	CHOICE	GOOD
STANDARD	COMMERCIAL	UTILITY
CUTTER	CANNER	

CLASSIFICATION OF CATTLE ACCORDING TO AGE

CALVES	YEARLINGS	TWO-YEAR-OLDS
COWS	BULLS	STAGS

HERITABILITY ESTIMATES FOR BEEF CATTLE CHARACTERS

CHARACTER	APPROXIMATE HERITABILITY OF CHARACTER IN PERCENT
BIRTH WT.	45%
WEANING WT.	26%
WEANING CONFORMATION SCORE	32%
DAILY RATE OF GAIN FROM WEANING TO MARKETING	46%
EFFICIENCY OF FEED UTILIZATION	39%
ON—FOOT GRADE AT SLAUGHTER TIME	38%
CARCASS GRADE	39%
AREA OF RIB EYE	70%
REPRODUCTIVE PERFORMANCE	25—30%
COW MATERNAL ABILITY (MOTHERING ABILITY AND MILK PRODUCTION)	30%
TENDERNESS	50%
FAT THICKNESS	32%
CARCASS YIELD	35%
YIELD OF RETAIL CUTS	35%

PRODUCTION RECORD FORMS

CALF & YEARLING WEIGHTS & GRADES RECORD

Sire	Dam		Calving Record			
Herd Identity Number		Age of Dam	Calf Number	Sex	Date Calved	Birth Weight

Weaning Record				
Weaning Weight	Age in Days	*Adjusted 205 Day Weight	Weight Per Day of Age	Weight Ratio or Grade

Yearling Record				
Age in Days	Yearling Weight	**Adjusted 365 Day Weight	Weight Per Day of Age	Weight Ratio or Grade

*To compute the adjusted 205 day weaning weight, apply the formula:

$$\frac{\text{actual weight - 70}}{\text{age in days}} \times 205 + 70 = 205 \text{ day weight}$$

then correct the adjusted weight for the age of the dam according to the following table:

Percent to be added to calf weights after adjusting for age

Age of dam	Percent to be added
2	15
3	10
4	5
5-10	none
11 and older	5

**To compute the adjusted 365 day weight, apply the formula:

$$\frac{\text{final weight - actual weaning weight}}{\text{number of days between weights}} \times 160 + 205 \text{ day adjusted weaning weight} = \text{adjusted 365 day weight}$$

PRODUCTION RECORD FORMS

SIRE'S ANNUAL PRODUCTION RECORD										
Sire's Herd Identity Number	Calf Number	Sex	205 Day Adjusted Weight	Weight Ratio	Grade	365 Day Adjusted Weight	Weight Ratio	Grade	Replacements	Remarks

LIFETIME PRODUCTION RECORD OF DAM								
Herd Identity Number	Year of Birth	Average Total Production at Weaning				Production Index	Replacements	Remarks
		Number of Calves	Adjusted Weaning wt.	Weight Ratio	Grade			

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic : Selecting Dairy Cattle

*Terms: All terms underlined are included in the "Glossary of Terms."

Note: See Topic 10a for factors to consider in determining the "Type of Producer" and "The Selection of a Breed."

The five common breeds of dairy cattle are the Ayrshire, the Brown Swiss, the Guernsey, the Holstein-Friesian, and the Jersey. Although there is no one best breed, there may be a particular breed that is preferred by the individual dairyman because it is better adapted to certain environmental conditions and market demands.

I. Factors to Consider in Selecting a Dairy Breed

Selecting a breed of dairy cattle is like selecting any other item where the individual has a variety from which to choose. Quite often after considering all the advantages and disadvantages, personal preference may be the determining factor.

It would be advisable for one to consider each of the factors below in selecting a breed of dairy cattle.

A. The availability of breeding stock of the type and quality that is desired by the individual should be considered.
B. The dairyman's markets for milk and butterfat may influence his choice of breeds.
C. The availability of forage crops and pastures may be an important consideration since the larger and more rugged breeds require more roughages.
D. Since breeds differ in their ability to withstand high and low temperatures, climatic conditions should be considered.
E. The heifers of larger breeds do not usually mature and come into production as early as the smaller breeds; therefore, age of maturity is a factor.
F. It may be an advantage to choose the breed most popular in the community from the standpoint of having a source of breeding stock and a market for surplus stock.
G. The size and vigor of newborn calves should be considered as replacement prospects and also from the standpoint of calving difficulties.

II. Selecting Individual Animals

Factors that should be considered in selecting a dairy animal are type or physical appearance, production records, pedigree, and health and vigor. In addition to the four previously mentioned factors, mammary development should be considered when selecting dairy heifers.

One would prefer to use all of the above factors as a basis of selection; however, this is rarely possible because records are incomplete on most animals.

From a study conducted in East Texas, it was determined that one-fourth of the cows in the average dairy herd were culled each year. It is thought that this rate of culling is about average for the rest of the State. Since the productive ability of a cow tends to increase each succeeding lactation up to maturity (six years of age) dairy cows in the average dairy herd in Texas are culled before they reach their maximum production. Proper selection of dairy animals should increase the number of years that cows remain in the milking herd, increase the herd's milk production, and lower the production costs.

A. Type as a Basis for Selection

Since type and production are usually closely correlated, it is necessary that the prospective dairyman be familiar with correct dairy type. Type is important because it indicates that the animal has the conformation and physical characteristics for high milk production.

Transparency No. 1

Prior to becoming familiar with dairy type, one should learn the parts of a dairy cow. This is necessary so that a person can understand the terminology applied to those parts and to be able to follow the discussion related to the selection of dairy animals.

Transparency No. 2

The five major dairy breed associations of the United States have cooperated through the Purebred Dairy Cattle Association to develop a unified score card for dairy cows and bulls that has been approved by all of these dairy breeds. The unified score card indicates the points or criteria to be considered in selecting dairy animals and the emphasis to be given each point.

The four major areas included on the score card are: (1) general appearance, (2) dairy character, (3) body capacity, and (4) mammary system.

Each of the four major areas are further subdivided and the relative importance of each characteristic is designated by points on the score card. Every person should become familiar with the score card; it will assist him in selecting dairy animals.

Transparency No. 3

In an effort to improve dairy type and thus increase production, each breed association has a type classification score card used by an official classifier to rate animals within the breed as to type or general appearance.

One should follow a definite order of inspecting dairy animals. The same recommendations for inspecting beef animals are recommended for selecting dairy animals. To briefly review the procedure, one should use the following order of inspection: Step 1, sideview; Step 2, rear view; Step 3, front view; and Step 4, contact step. The animal is observed from approximately 20 feet in the first three steps, and close inspection of the animal is made in step four.

Note: Your attention is called to the characteristics listed under transparencies number four through six. Only a few of the characteristics are listed. Undoubtedly, you will see many more that should be discussed with your students.

Transparency No. 4

Some characteristics that should be considered when discussing desirable and undesirable general appearance and dairy character are:

General Appearance	Dairy Character
1. Size	1. Milking ability
2. Head	2. Angularity
3. Shoulders	3. Freedom from coarseness
4. Back	4. Neck
5. Hook bones	5. Withers
6. Rump	6. Ribs
7. Legs and feet	7. Flanks
8. Breed characteristics	8. Thighs
	9. Skin

Transparency No. 5

Barrel and heart girth are the major characteristics to consider in determining body capacity of a dairy animal. Characteristics that may be considered are:

Barrel	Heart Girth
1. Long, deep barrel	1. Large, deep heart girth
2. Ribs widely sprung	2. Full crops
3. Depth of barrel tending to increase toward rear	3. Wide chest floor
	4. Blending of heart girth and shoulders

Transparency No. 6

Some characteristics of the udder are:

Udder—Strongly attached, well balanced, wide and deep, soft and pliable
Fore udder—Uniform width from front to rear, moderate length.
Rear udder—High, wide, strongly attached, uniform.
Teats—Medium length, squarely placed, plumb.
Mammary veins—Large, long, tortuous.

B. Production Records as a Basis for Selection

Production records take much guesswork out of selecting dairy animals; they will show the productive capacity of the cow and give an indication of the possible production of the offspring. Since the production records of a purebred animal and of its ancestors are recorded on the pedigree, increasingly large numbers of dairy herds are being tested in dairy herd improvement association programs.

Dairymen who keep production records usually keep one of the following three types: (1) DHIA (Dairy Herd Improvement Association), (2) Weigh-A-Day-A-Month, and (3) Owner-Sampling Testing Records. Each of these types involves weighing the milk produced by each cow in the herd one day a month. Milk samples from individual cows can be collected when a butterfat test is to be made. Other records usually kept with production records are freshening dates, drying dates, and breeding dates.

1. The Dairy Herd Improvement Association, DHIA, which is supervised by the U.S.D.A. Agricultural Research Service, Dairy Cattle Research Branch, State Agricultural Extension Services, and the local DHIA Board of Directors, provides maximum information of production and feeding for each cow in the herd. The actual testing of the cows is carried out by an approved tester who visits the dairy one day each month to weigh and sample milk, make butterfat tests, and calculate production and feed records. This information is sent to data processing centers for computation and summarization and is then returned to the dairymen. The report contains individual cow's records such as daily milk weights, butterfat percent, concentrates fed, reproductive status, value of milk produced, feed cost, and income over feed cost. It also contains a herd summary for the test period.
2. The dairyman keeping the Weigh-A-Day-A-Month records weighs the milk from each cow one day a month. He multiplies this day's production by the number of days in the month to get the monthly production per cow. He also records freshening dates, drying dates, and breeding dates on each cow in the herd.
3. The Owner-Sampler Records are kept by dairymen interested in a less expensive herd improvement and testing plan. Dairymen using this plan weigh and sample each cow's milk one day each month, and the tester picks up the samples and calculates the results. Because the dairyman takes his own samples, this is not an official test; nevertheless, the information received by the dairyman is important to efficient management.

Transparency No. 7

Dairy Herd Improvement Records—This form, DHI-201, shows an example of the type of information that is recorded on the DHIA.

Transparency No. 8

The age conversion table will serve as a guide for estimating dairy animals' productive capacity; however, more accurate tables are available. The productive capacity of dairy animals tends to vary in the geographic areas of the U. S. The age conversion table developed for your area would give a more accurate estimate of a cow's production.

Production records are a good indication of the cow's productive capacity; but the records can be influenced by the time of calving, number of milkings per day, length of previous dry period, age, kind and amount of feed, month of lactation, and management practices. One should consider the above factors when examining production records. Possibly the greatest returns a dairyman receives for his labor is the time he spends keeping accurate herd, and other, records. Accurate records will serve as a guide to most of the management decisions made by dairymen.

How to use the Conversion Tables:

Suppose you have a Holstein cow that has just completed a 315-day lactation record which she began as a 4-year-old. She was milked three times daily and produced 500 pounds of butterfat. First, look at the "Age" section. The production of a 4-year-old Holstein should be multiplied by 1.08, so multiply 500 x 1.08, which equals 540 pounds of butterfat.

Next look at the "3x Milking Records" section and multiply 540 x .87, which equals 469 pounds of butterfat.

Finally, look at the "Length of Lactation" section. A 315-day lactation record should be multiplied by .98. By multiplying 469 x .98 the final answer is 460 pounds of butterfat. This figure now is standardized and can be plotted on the arrow chart.

C. The Pedigree as a Basis for Selection

Transparency No. 9

The pedigree lists the ancestors of an animal; and in some instances, the pedigree includes the production records and type classification of the animal and some of its ancestors. Most pedigrees show three generations, but some breed associations will provide extended pedigrees showing several generations. Usually an additional fee is charged for an extended pedigree.

When using the pedigree as a basis of selection, the most consideration should be given to the sire and dam, as they contribute fifty percent to the animal's make-up. The other ancestors contribute the other fifty percent. The more production records shown on the pedigree, the more reliable the information as to the possible production capacity of the animal under consideration.

Transparency No. 10

Other important factors in selecting dairy animals are character and heritability estimates. To assist in determining the estimated heritability of a given factor, the following example is given. If from a herd of cows averaging 13,000 pounds of milk heifers were selected from 16,000 pound dams, how much of the 3,000 pounds superiority of the cows would show up in the offspring?

Since the cow contributes half to the offspring, the 3,000 pounds superiority should be divided by two, which equals 1,500 pounds. According to the heritability chart, milk production is twenty-five percent heritable. Multiply 1500 x .25 to get the estimated increase in milk production of the offspring. The offspring of the selected parents in the above example would have a predicted increase of 375 pounts of milk over the present herd average.

The following table gives the approximate heritability percent of some of the inherited traits in dairy cattle.

HERITABILITY ESTIMATES OF DAIRY CATTLE

Trait	Average Percent
Fat test	50
Protein test	50
Size	50
Birth weight	45
Weight	35
Gestation length	35
Fore and rear udder	35
General appearance	33
Type	30
Dairy character	30
Milk yields	25
Mastitis	25
Breed character	25
Milking quality	24
Body capacity	23
Udder depth	22
Teats, veins, and quality	20
Feet, legs	18
Longevity	10
Udder size and shape	7
Teat length	5
Reproductive performance	3
Service/conception	3

The above data was obtained from "Livestock Breeding," Department of Agricultural Education, Ohio State University.

D. Health and Vigor as a Factor in Selecting Animals

Health and vigor should be considered in the selection of dairy animals. The general health of the herd can be determined by the calving record of the cows during the past year, the number of cows in production, the stages of production, and the amount of milk being produced.

The most serious causes of health problems in dairy herds are sterility, mastitis, udder troubles, Bang's disease, leptospirosis, and tuberculosis. It is desirable to buy animals only from herds that have been vaccinated or tested for Bang's disease and tested for tuberculosis and leptospirosis. If animals purchased have not been tested within the last thirty days for Bang's disease and tuberculosis, the animals should be tested before being purchased. To minimize health problems, one should select animals from a reputable breeder of a disease-free herd.

E. Mammary Development as a Factor in Selecting Dairy Heifers

Transparency No. 11

A dairy heifer's mammary glands develop in a definite pattern, according to the Dairy Department at the U.S.D.A. Beltsville Research Center. The gland starts in each quarter as a small vertical tube that extends from the teat upward toward the body. At four to six weeks of age, these tubes begin to thicken in the center; and as they enlarge, they tilt back toward a horizontal position.

In 50 to 75 percent of the udders of heifers at four months of age, the front and rear glands had fused, or joined, leaving a well defined V-shaped depression or notch above the fusion. The depression or notch between the front and rear quarters becomes less pronounced as the udder grows. The gland size is an important factor in selecting heifers. The larger the gland at a given age, the better milker the cow should be.

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1. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.

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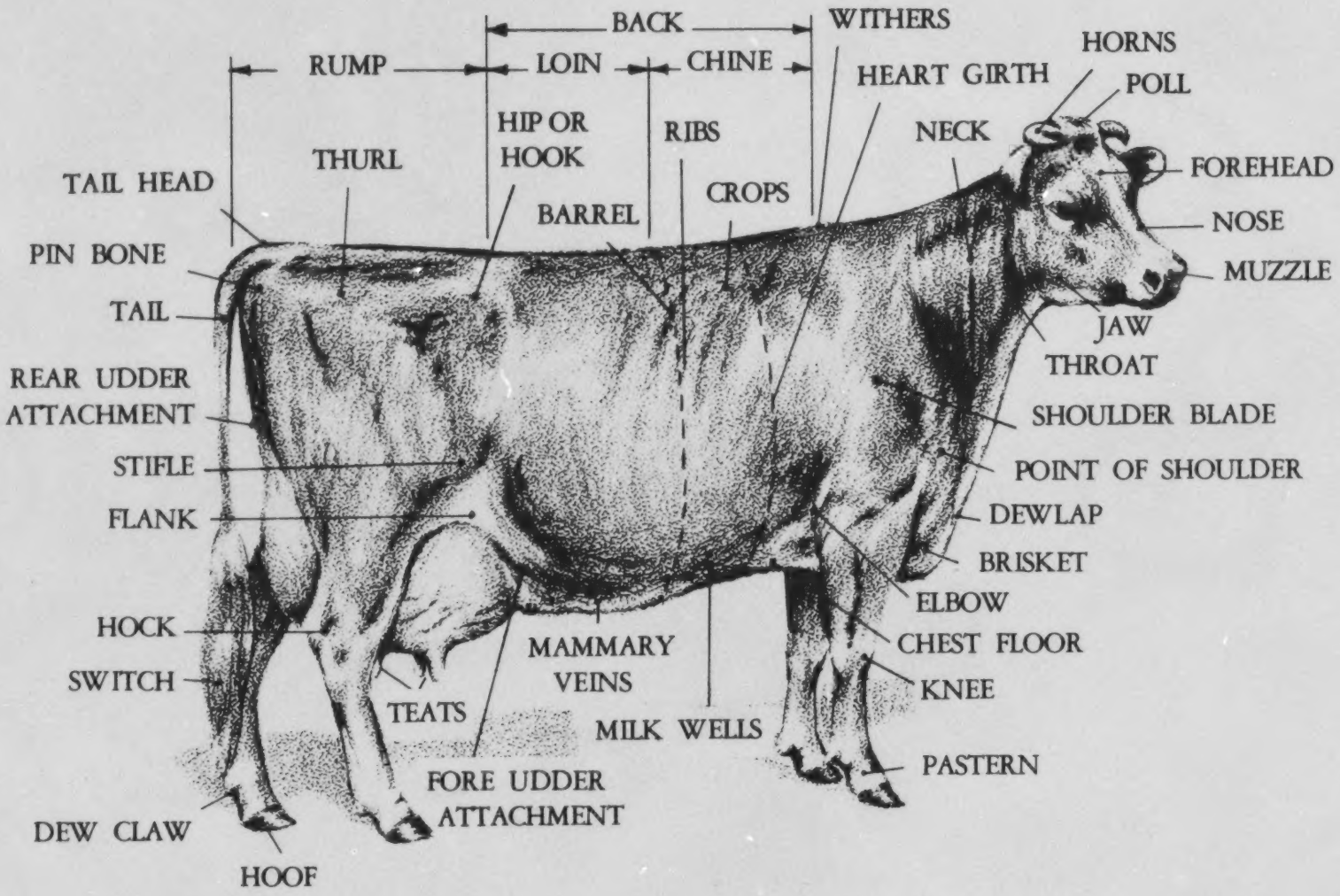
5. Breed Association publications and journals

PARTS OF A DAIRY COW



DAIRY COW UNIFIED SCORE CARD

BREED CHARACTERISTICS SHOULD BE CONSIDERED IN THE APPLICATION OF THIS SCORE CARD		Perfect Score
Order of Observation		
1. GENERAL APPEARANCE		**30**
(ATTRACTIVE INDIVIDUALITY WITH FEMININITY, VIGOR, STRETCH, SCALE, HARMONIOUS BLENDING OF ALL PARTS AND IMPRESSIVE STYLE AND CARRIAGE. ALL PARTS OF A COW SHOULD BE CONSIDERED IN EVALUATING A COW'S GENERAL APPEARANCE)		
BREED CHARACTERISTICS	10	
COLOR		
SIZE		
HEAD		
SHOULDER BLADES	10	
BACK		
RUMP		
LEGS AND FEET	10	
2. DAIRY CHARACTER		**20**
(EVIDENCE OF MILKING ABILITY, ANGULARITY, AND GENERAL OPENNESS, WITHOUT WEAKNESS, FREEDOM FROM COARSENESS, GIVING DUE REGARD TO PERIOD OF LACTATION)		
NECK , WITHERS, RIBS, FLANKS, THIGHS, AND SKIN.	20	
3. BODY CAPACITY		**20**
(RELATIVELY LARGE IN PROPORTION TO SIZE OF ANIMAL, PROVIDING AMPLE CAPACITY, STRENGTH, AND VIGOR)		
BARREL	10	
HEART GIRTH	10	
4. MAMMARY SYSTEM		**30**
(A STRONGLY ATTACHED, WELL BALANCED, CAPACIOUS UDDER OF FINE TEXTURE INDICATING HEAVY PRODUCTION AND A LONG PERIOD OF USEFULNESS)		
UDDER	10	
FORE UDDER	6	
REAR UDDER	7	
TEATS	5	
MAMMARY VEINS	2	
	TOTAL	**100**

CLASSIFIER'S REPORT OF HERD CLASSIFICATION

SIRE NUMBER	ANIMAL NUMBER	NAME OF ANIMAL	DATE OF BIRTH MO.	DAY	YR.	FINAL SCORE *	GENERAL APPEARANCE	DAIRY CHARACTER	BODY	MAMMARY	STATURE	HEAD	FRONT END	BACK	RUMP	HIND LEGS	FEET	FORE UDDER	REAR UDDER	UDDER SUPPORT AND FLOOR	QUALITY	TEATS	MISCELLANEOUS
						DESCRIPTION OF ANIMAL																	
											GENERAL											MAMMARY	
1000000	4567891	PRAIRIE VIEW SALLY	06	08	56	90	E	E	E	E	1	3	2	1	1	2	1	2	1	2	2	1	

TERMS—GENERAL

STATURE

1. UPSTANDING
2. INTERMEDIATE
3. LOW SET

HEAD

1. CLEAN-CUT, WELL-PROPORTIONED WITH STYLE AND STRENGTH
2. STRONG-LACKING STYLE
3. SHORT
4. PLAIN AND/OR COARSE
5. WEAK

FRONT END

1. SHOULDER SMOOTHLY BLENDED, CHEST STRONG AND WIDE
2. MEDIUM STRENGTH AND WIDTH
3. COARSE SHOULDER AND NECK
4. NARROW AND WEAK

BACK

1. STRAIGHT, FULL CROPS, STRONG
2. LACK OF DEFINED HALVING
3. FLOOR TOO LOW
4. TILTED
5. BROKEN SUSPENSORY LIGAMENT AND/OR WEAK FLOOR

* E (EXCELLENT)	90-100	G (GOOD)	75-79
V (VERY GOOD)	85-89	F (FAIR)	65-74
+ (GOOD PLUS)	80-84	P (POOR)	64&BELOW

CLASSIFIER'S SIGNATURE _____ DATE _____

UDDER QUALITY

1. SOFT AND PLIABLE
2. INTERMEDIATE
3. COULD NOT DETERMINE
4. MEATY

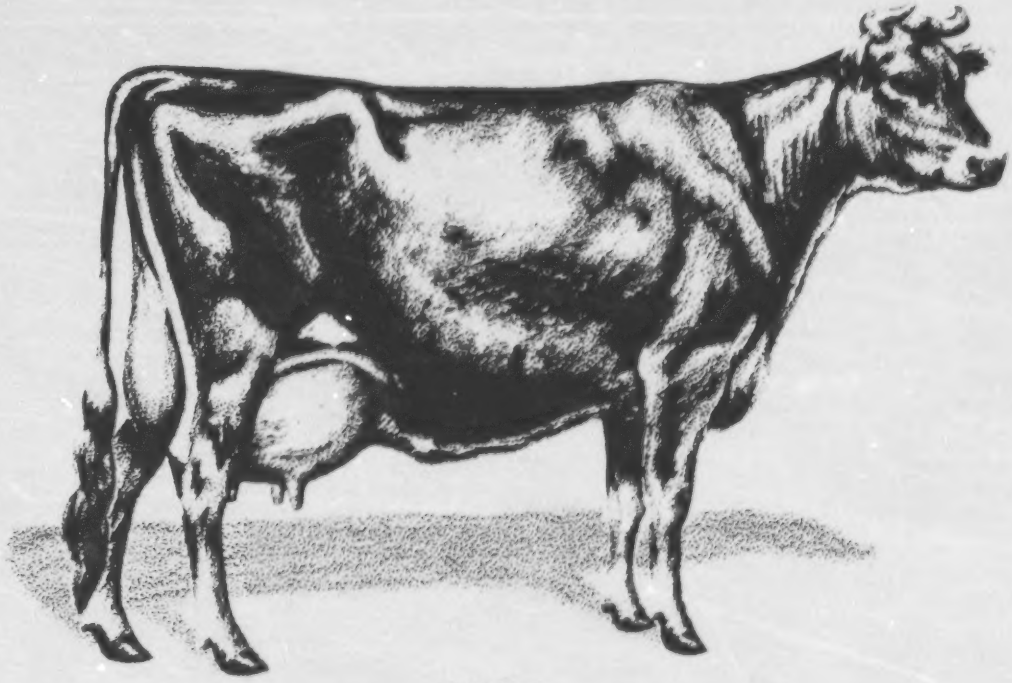
TEAT SIZE AND PLACEMENT

1. PLUMB, DESIRABLE LENGTH AND SIZE AND SQUARELY PLACED
2. TOO CLOSE ON SIDE
3. REAR TEATS BACK TOO FAR
4. WIDE FRONT TEATS
5. UNDESIRABLE SHAPE

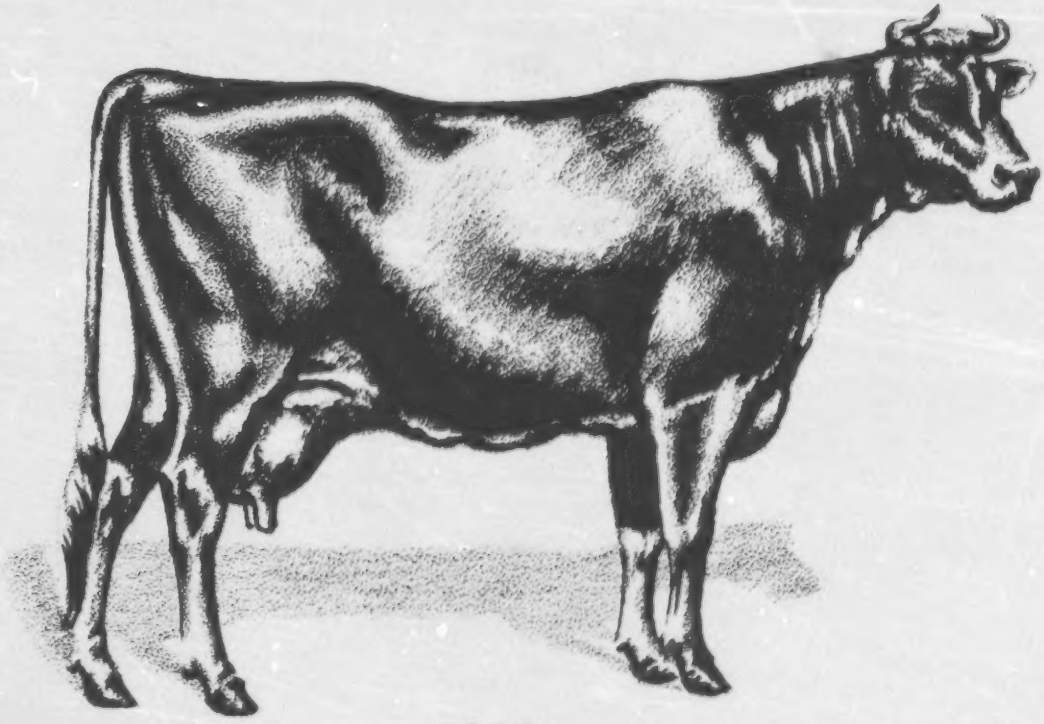
TERMS — MISCELLANEOUS

1. WINGED SHOULDER
2. FRONT LEGS TOE OUT
3. WEAK PASTERNS
4. CRAMPY
5. SMALL FOR AGE

DAIRY CHARACTER



GOOD

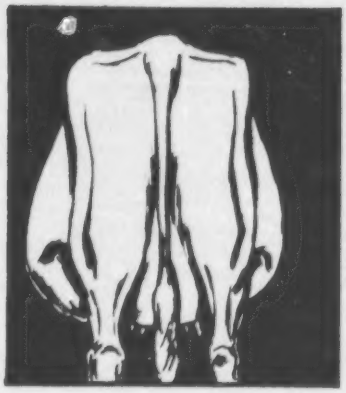


POOR

BODY CAPACITY

GOOD

POOR



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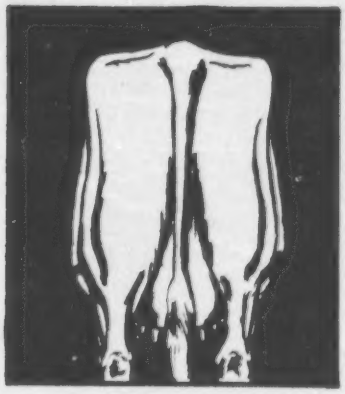
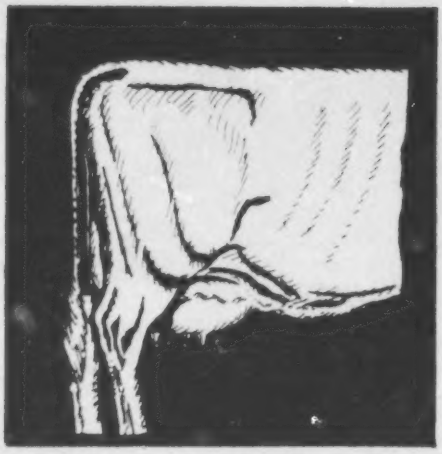


POOR

GOOD

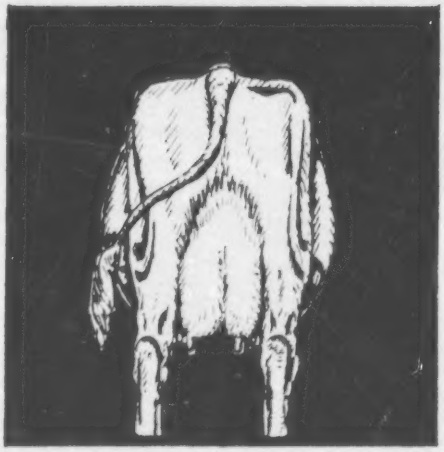
POOR

MAMMARY DEVELOPMENT

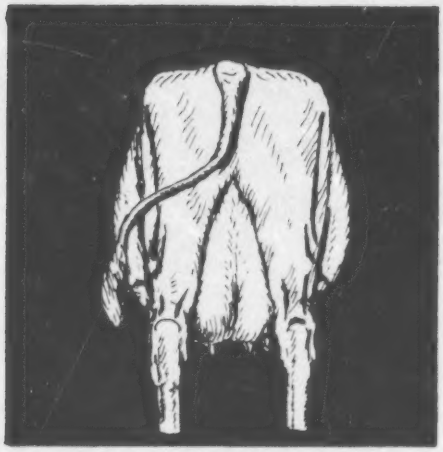


GOOD UDDER AND FORE UDDER ATTACHMENT

POOR UDDER AND FORE UDDER ATTACHMENT



GOOD UDDER AND REAR UDDER ATTACHMENT



POOR UDDER AND REAR UDDER ATTACHMENT

DAIRY HERD IMPROVEMENT RECORDS

BARN SHEET--DHI-201

BRED	REGISTRATION OR EAR-TAG NO.	COW INDEX NO.	LAST TEST DAY DATA: DAILY MILK WEIGHTS LBS.	LAST TEST DAY DATA: %B-FAT	LAST TEST DAY DATA: DATE MO.	LAST TEST DAY DATA: DATE DAY	CURRENT TEST DAY DATA: MILKING WTS 1ST	CURRENT TEST DAY DATA: MILKING WTS 2ND	CURRENT TEST DAY DATA: %B-FAT	CURRENT TEST DAY DATA: SAMPLE NO.	CURRENT TEST DAY DATA: DATE MO.	CURRENT TEST DAY DATA: DATE DAY	CURRENT TEST DAY DATA: CONC. FED LBS.	REPRODUCTIVE STATUS: LAST DATE BRED	REPRODUCTIVE STATUS: DATE DUE	SIRE OR CALF ID
3	G4WAF4203	0002	33.0	3.3	9	25	17.5	18.0	3.5	6	10	25	5	8-18-73	5-28-74	H78

LACTATION RECORDS TO DATE ENTERED HERD

INDEX NUMBER	LAST MONTH: DAILY MILK WEIGHTS	LAST MONTH: %B-FAT	DATE OF FRESHENING: MO.	DATE OF FRESHENING: DAY	DATE OF FRESHENING: YEAR	NUMBER DAYS: DRY	NUMBER DAYS: IN MILK	MILK POUNDS	FAT POUNDS	VALUE PRODUCT	INCOME OVER FEED COST
0061	44.3	4.0	12	15	72		215	9,521	503	495.00	250.00

MONTHLY HERD DATA

GROUP	SILAGE			DRY FORAGE			GROUP FED CONC.			PASTURE		CONCENTRATES	
DRY	LBS.	CONS.	COST ENE TON	LBS.	CONS.	COST ENE TON	LBS.	CONS.	COST ENE TON	QUALITY	COST/M	COST ENE TON	
3													
MILK													
2													
MILK				8.0		$36.00							$123.00

DATE OF TEST: MO.	DAY	YEAR	BULK TANK WEIGHTS(LBS.): NO. MILKINGS	TOTAL LBS. OF MILK	MILK PRICING INFORMATION: NET/CWT. $	CENTS	%B-FAT	B-FAT DIFF. CENTS	10TH	BEGINNING TIME OF MILKING: A.M. HOUR	A.M. MIN.	P.M. HOUR	P.M. MIN.	REPORT FOR MONTH OF
9	25	73			9	82	3.8	0	09	6	15	5	15	SEPT.

SUPERVISOR NAME: WALKER

CONVERSION FACTORS

(USED TO STANDARDIZE RECORDS)

AGE

(BASED ON AGE WHEN PRODUCTION RECORD WAS BEGUN)

AGE YR., MO.	AYRSHIRE	BROWN SWISS	GUERNSEY	HOLSTEIN	JERSEY	MILKING SHORTHORN
2—0	1.30	1.45	1.24	1.31	1.27	1.42
3—0	1.18	1.23	1.12	1.18	1.15	1.24
4—0	1.10	1.10	1.06	1.08	1.06	1.13
5—0	1.03	1.04	1.02	1.02	1.02	1.07
6—0	1.00	1.00	1.00	1.00	1.00	1.01
7—0	1.00	1.00	1.00	1.00	1.00	1.00

3X MILKING RECORDS

AGE AT CALVING	FACTORS FOR 3X RECORDS
2 TO 3 YEARS	.83
3 TO 4 YEARS	.85
4 YEARS AND OVER	.87

LENGTH OF LACTATION

240 DAYS OR LESS	1.15	335 DAYS	.93
315 DAYS	.98	355 DAYS	.89

DAIRY CATTLE PEDIGREE

(NAME & REGISTRATION NO.)
CLASSIFIED VG

	#M	%	#F
2 REC. AV.	9775	5.2	508

SIRE
(NAME & REGISTRATION NO.)
CLASSIFIED EX

	#M	%	#F
12 DAUS. AV.	9150	5.2	476
12 DAMS AV.	8800	5.0	440
	+350	+0.2	+36

10 DAUS. CLASSIFIED AV. 84.1

DAM
(NAME & REGISTRATION NO.)
CLASSIFIED GP

	#M	%	#F
3 REC. AV.	9200	5.0	460
2 DAUS. AV.	9100	5.3	482

GRAND SIRE
(NAME & REGISTRATION NO.)
CLASSIFIED VG

	#M	%	#F
10 DAUS. AV.	8500	4.9	417

10 DAUS. CLASSIFIED AV. 84.0

GRAND DAM
(NAME & REGISTRATION NO.)
CLASSIFIED VG

	#M	%	#F
4 REC. AV.	8900	5.5	489

GRAND SIRE
(NAME & REGISTRATION NO.)
CLASSIFIED GP

	#M	%	#F
15 DAUS. AV.	8750	5.2	446
15 DAMS AV.	8600	4.9	421
	+150	+0.2	+25

GRAND DAM
(NAME & REGISTRATION NO.)
CLASSIFIED VG

	#M	%	#F
2 REC. AV.	9700	5.0	485

NOTE: ALL RECORDS ADJUSTED TO 2X-305 DAYS MATURE EQUIVALENT BASIS.

DAIRY CATTLE PEDIGREE TERMS AND ABBREVIATIONS

1. 2X-305 Days - Milked twice a day for 305 days; the records on most pedigrees are adjusted to 2X-305 days mature equivalent basis.
2. #M - Pounds of milk
3. % - Percent of butterfat
4. REC. - Record(s)
5. #F - Pounds of butterfat
6. AV. - Average
7. DAUS. - Daughters

HERITABILITY ESTIMATES OF DAIRY CATTLE

TRAIT	AVERAGE PERCENT
FAT TEST	50
PROTEIN TEST	50
SIZE	50
BIRTH WT.	45
WEIGHT	35
GESTATION LENGTH	35
FORE AND REAR UDDER	35
GENERAL APPEARANCE	33
TYPE	30
DAIRY CHARACTER	30
MILK YIELDS	25
MASTITIS	25
BREED CHARACTER	25
MILKING QUALITY	24
BODY CAPACITY	23
UDDER DEPTH	22
TEATS, VEINS AND QUALITY	20
FEET, LEGS	18
LONGEVITY	10
UDDER SIZE AND SHAPE	7
TEAT LENGTH	5
REPRODUCTIVE PERFORMANCE	3
SERVICE / CONCEPTION	3

STAGES OF MAMMARY GLAND DEVELOPMENT

IN THE HEIFER

A

BIRTH TO 1 MONTH
TUBULAR STAGE

B

1 TO 2 MONTHS
ENLARGEMENT STAGE

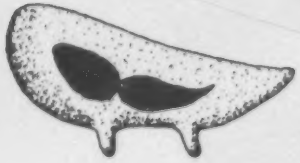
C

2 TO 3 MONTHS
QUARTER STAGE

D

3 TO 4 MONTHS
QUARTER STAGE

E

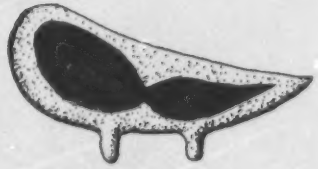


4 TO 5 MONTHS
HALF STAGE

F

5 TO 6 MONTHS
HALF STAGE

G



OVER 6 MONTHS
HALF STAGE

V-A-1

II-A-8b
No. 11

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 8c: Selecting Horses

*Terms: All terms underlined are included in the "Glossary of Terms."

I. Use as a Basis for Selection

The purpose for which a horse will be used is one of the first criterion to be considered in the selection of horses. From the standpoint of use, all equine can be separated into two major categories, (a) work horses or draft horses, and mules, and (b) light horses and ponies.

Draft horses and mules were bred and developed for their strength and are used for logging, plowing, and other work for which power and strength are necessary. The few that are still being used are located mainly in the timber areas of Texas. Since they are of little significance to the horse industry in Texas, work horses and mules will be excluded from the remainder of the topic.

The light horse breeds include all breeds other than the draft breeds. In Texas, the purposes for which light horses are used include: ranch work; racing; rodeo uses such as roping, barrel racing, dogging, grand entries; horse show events such as halter, reining, various pleasure classes, roping, barrel racing, cutting; working cow horse events; pole bending; trail classes; jumping; gaited classes; and costume classes; trail riding; parades; personal pleasure; breeding; and others.

When selecting a horse, it is important to first determine the purpose for which it will be used. After the purpose or purposes have been determined, then the breed or breeds which have been developed to perform these purposes should be considered.

Unlike all other classes of livestock, horses are produced primarily for purposes other than a source of human food. Since the value of a horse is based on live performance, carcass data cannot be related to live conformation in order to determine the ideal. However, other criteria have been established by equine breeders, anatomists, trainers, veterinarians, and other horse specialists which provide sound basis for selection.

II. Breed as a Basis for Selection

In selecting a breed, an individual should consider several factors.

A. First, he must determine what breed or breeds are capable of best performing the purpose or purposes for which he is to be used. For example; in selecting a breed for the purpose of roping, it is necessary that the animal be capable of a fast break, early top speed, capable of a sudden stop, calm in disposition,

strong but agile, and have cow sense. The Quarter Horse, Paint, and Appaloosa breeds have been bred and developed to possess these characteristics; therefore, for the purpose of roping, these three breeds would be considered.

B. Secondly, the access to shows or contests where the horse will be used or exhibited will help one to decide upon the breed to be selected. Each breed associatior provides for horse shows and oontests for horses registered in its contests or shows, it would be necessary to select a breed for which shows and contests are provided in the particular locality. For example; in west Texas, Quarter Horse shows are predominant; therefore, the selection of an animal for the purpose of showing in roping horse shows in west Texas would be, for all practical purposes, the selection of a registered Quarter Horse. However, if the purpose of the roping horse is for competition in rodeos, any of the breeds could be selected based on personal preference.

C. A third consideration in selecting on the basis of breed is the diversity of the breed or its ability to perform in several capacities. For example; the Quarter Horse breed is known for its great ability to adapt to all phases of ranch work and also to perform several show and rodeo events. Quarter Horses are also superior to other breeds in short distance races. Therefore, if a horse of the Quarter Horse breed were selected to make a roping horse, he would also have value for other purposes.

D. A fourth consideration in selecting on the basis of breed is cost. Certain breeds of horses demand larger prices than others. However, in considering cost, an individual must keep in mind the purpose for which the animal is being selected. The cost of one breed may be more than the cost of another; however, based on performance, the more expensive breed may be cheaper in the long run. For example; again using roping as the purpose for which a horse is to be selected, a Paint horse may be more expensive than a Morgan, but the Paint horse possesses those characteristics necessary for roping and would be the best selection for this purpose.

E. Individual preference is very important and the fifth factor in the selection of a breed. If two or more breeds possess the necessary qualifications to perform a specific function, the individual should select the breed which he likes best, for maximum satisfaction and performance. For example; individuals of the Appaloosa, Paint, and Quarter Horse breeds all possess characteristics necessary in making a good rope horse; however, if the individual selecting the breed likes the Appaloosa better than the Paint or Quarter Horse, he will be better satisfied with an animal of this breed.

F. In considering breed selection, a person who is not fully acquainted with the various breeds, their characteristics, association's rules and regulations, the registries, etc., should write the associations for available information, read the various breed publications, and talk to competent breeders and trainers.

Since some of the breeds within the light horse category are in more demand in Texas and play a greater role with respect to use and economic contributions in the state, the discussion will be limited primarily to breeds of the light type. Also, considering that the light horse class includes types ranging from gaited breeds to race breeds and since ideal conformation and purposes are so different, each type should be discussed separately. The objective of this discussion will be to establish a basis for selecting the stock horse type and will include those breeds which are bred for those purposes.

III. Selection Based on Individuality

There are many factors to be considered in the selection of the individual animal. After the purpose for which the horse is to be used and the breed of horse have been determined, the next step is the selection of the individual animal. Individuality is of major importance in selection as there may be a greater difference between individuals of the same breed than between individuals of two different breeds.

The stock horse (Quarter, Paint, and Appaloosa breeds and some crosses with other breeds, mostly thoroughbred and Arabian) is considered the most versatile of horses. They have been selected and bred on the basis of their athletic abilities, early speed, and disposition, making them best adapted to all aspects of ranch work, arena performance (other than gaited classes), and short distance racing. Thus, the selection of the individual stock horse type is based on several factors: conformation, disposition, intelligence, bloodline, sex, age, performance, and soundness.

A. Selection on the Basis of Conformation

The ideal in conformation varies somewhat among the various breeds of light horses. However, certain conformation characteristics are common to all breeds. The conformation characteristics discussed here will pertain mainly to the stock horse type which is predominant in Texas. The ideal conformation for the various breeds can be obtained from the breed associations.

A direct relationship has been established between a horse's ability to perform and his conformation. Certain breed and racing associations have defined, to a high degree of correctness, certain measurements of the horse's anatomy which will determine the level he will be physically able to perform a given task. These measurements have been computer-programmed and can be of great assistance in selecting individuals, especially for breeding purposes. However, for the purposes of individual selection, visual appraisal is necessary.

Transparency No. 1

Before studying conformation and developing a mental picture of the ideal type, it is necessary to know the parts of the horse. Ideal type is the result of an incorporation of the correctly conformed parts. In selecting a horse on confor-

mation a similar procedure to selecting other classes of livestock is used; step 1, side view; step 2, rear view; step 3, front view; step 4, close inspection; and step 5, movement. In the first three steps, the horse is viewed from a distance of about 20 feet. In step four, the animal is inspected up close. The legs should be particularly well inspected for defects or injury. Certain defects such as splints cannot always be seen but can usually be felt by an experienced horseman. In the fifth step, the horse should be observed from the front and rear in a walk and trot. This step is important to see if the animal tracks correctly and if the legs move in a straight line. It should be kept in mind that, in most cases, unless the animal possesses correct conformation, he will not be able to perform at the highest level, regardless of how good he is on the basis of other factors.

Transparency No. 2

The first step in establishing ideal stock horse conformation is to determine the total make-up in terms of balance. It is necessary to have a mental picture of the skeletal system of the horse in order to establish the conformation that will constitute correct balance. To achieve his maximum speed immediately from a stopped position, to gather and stop in one or two strides from a dead run, and to turn and roll back instantly, a horse must possess correct balance, which in turn, is the key to the superior performance of the stock horse.

To establish the correct balance and conformation, a horse should be viewed first from the side, since more of the animal can be seen at once. The animal is observed as a whole at a distance of 15 to 20 feet.

Transparency No. 3

Correct Balance in Conformation of the Horse

"Thumb of rule measurements" are easily used in determining whether or not an animal is correctly balanced as shown in this illustration.

The length from the forward-most point of the humerus (point of the shoulder) to the top of the front of the withers(A), the length of the back and loin (B), the length from the point of the hip to the hindmost point of the ischium (at the buttock) (C), and the length from the center of the neck at the point of attachment to the shoulder to the center of the neck at the point of attachment of the head (D) should all be approximately equal. Also, the length of the foreleg from the joint of the humerus and radius to the center of the joint of the cannon and pastern bones (E) should be equal to the length from the top of the withers to the floor of the chest (heart girth) (F). The slope of the shoulder and the pasterns should be equal and approximately 45^{o}. The height at the top of the hip should be approximately equal to the height at the withers, which should be between 58 and 62 inches, or from 14-2 to 15-2 hands.

These "rule of thumb measurements" are accurate in selecting for balanced conformation in the mature animal, although they may give some indication in

the immature horse. The depth of the heart girth (F) will not be actual until maturity. However, the other measurements except for height will be proportional after about six months.

This type of skeletal make-up should constitute a basis for conformation which will place the center of balance almost directly behind the front shoulder or the heart girth. This point of balance represents the approximate point at which the rider's weight will be supported. It must be understood that the "thumb of rule measurements" are only an aid in helping determine the balanced conformation of the ideal stock horse type and reflect only the proportionate skeletal make-up of the animal.

Transparency No. 4

Ideal Stock Horse Conformation

After the correctness of balance has been determined, the musculature and shape of the animal are observed.

Sideview: Continuing with the sideview, the feet and legs are examined first, since the utility of the animal is dependent upon their soundness. The feet should be round and proportionate in size to the animal's body and legs, not too large but not too small. The forearm should be long and the cannon short in length. The joints of the legs should be adequate in size to denote strength. The fore and hind cannon bones should be flat, and the hocks should be low set. The pasterns should be of moderate length. The muscling in the legs should be well developed and defined in the forearm and gaskin and should continue up into the hip and shoulder.

Bunchy muscling as well as too long muscling are undesirable. The legs should fit into the shoulders and the hips, giving the appearance of continuation.

From the side, the shoulder should be well muscled, tapering up into well defined withers. The shoulders should be clean behind as they tie into the body and exhibit a slope of approximately 45°.

The body should appear symmetrical and exhibit a long, well muscled underline, being clean but not cut up in the flank. The back should be short and well muscled through the loin.

As viewed from the side, the rump should appear long and slope gradually from the top to the buttock with a well set tail head. Muscling should be pronounced down through the round and thigh and into the leg with a bulging stifle muscle.

The neck should blend well into the shoulder so that it is carried a little above being straight out from the body. It should be slender and well muscled and clean in the throat hatch.

From the side, the head should be small and blend into the neck so that it appears to belong. The jaw should not be overdeveloped, and the length between the jaw and muzzle should be short. A shallow mouth is ideal with large nostrils. The eyes should be large and set well out on the corner of the head, and the ears should be small.

Frontview: From the front, the animal should stand up well on straight legs. The bone assembly in the front legs should be straight through the knee and fetlocks with no offset or turn in the joints. The legs should fit squarely into the corners of the shoulders. The chest should appear deep and well muscled, exhibiting a good "V" muscle. The appearance of the head should denote intelligence, showing good muscling in the forehead with alert ears and wide set eyes.

Rearview: When viewing the horse from behind, the overall shape of the hindquarters should give the appearance of an apple, with the widest part being through the stifles. The stifle muscles should be well defined with the hips sloping inward and upward, rounding into the top of the hips. The hind legs should be set wide apart but straight and in the center of each hip, denoting inside and outside muscling of the hips. The gaskin should exhibit long, well defined muscling inside and outside, tying down into low set, clean hocks of ample size.

Transparency No. 5

Conformation Defects of Head, Neck, and Body

After the correct conformation has been established, it is necessary to be able to identify the basic conformation defects:

1. Head:
   a. pig-eyes—small eyes located down on the sides of the head causing inadequate peripheral vision.
   b. Roman nose—bulge in the bridge of the nose which is unsightly and impairs vision directly in front of the animal.
   c. parrot mouth—lower jaw shorter than upper, making grazing difficult or impossible.
2. Neck:
   a. thick neck and throat latch—excessive muscle and connective tissue in the neck and throat latch, impairing movement of head and neck and adding extra weight to the front end.
   b. cresty neck—excessive crest of fatty tissue, also impairing movement of head and neck.
   c. swe neck—caused by improper attachment of neck to shoulder, usually affecting the animal's ability to balance correctly.

3. Body:
   a. straight shoulders—usually constituted by a short scapula and radius and long humerus and cannon bone, causing a short, choppy, rough stride with impaired movement and lack of speed.
   b. mutton withers—usually associated with straight shoulders, making it hard to keep a saddle in place.
   c. long back—usually associated with straight shoulders and short hips, causing a shorter underline and thus a shorter stride.
   d. short hips—usually associated with a long back and straight shoulders and is generally the result of a short tibia and a long femur and rear cannon bone.
   e. weak back and loin—mostly found in long-backed horses and identified by a lack of muscling in these areas.
   f. short couple—identified with a short underline which can cause fouling of forelegs by hind feet.

Transparency No. 6

4. Forelegs and Feet:
   a. splay feet—turning out of feet characterized by a winging movement.
   b. pigeon toes—turning in of feet, constituting a paddling movement.
   c. base wide—associated with narrow chest and characterized by a winging movement.
   d. base narrow—usually associated with forelegs set too far out on shoulders, characterized by a paddling movement.
   e. off in the joints—joining of leg bones at the knees or ankles are offset.
   f. buck knees—over in the knees may result in damaged tendons or knees.
   g. coon feet—associated with long, weak pasterns, constituting a shortened first half of stride and a lengthened last half; may result in tendon or ankle damage.
   h. calf knees—gives a pounding gait and hard concussion of feet and knees; may result in damaged knees and feet.
   i. straight pasterns—characterized by a stilty action and short stride; may result in foot unsoundness.

Transparency No. 7

5. Hind Legs and Feet:
   a. cycle hocks—constitutes a shortened stride behind and may result in rear feet fouling the fore feet.
   b. post legs—characterized by short, choppy stride with possible damage to hocks and feet.
   c. cow hocks—causes winging movement in back legs and possible damage to hocks and legs by hitting togehter.
   d. bandy legs—characterized by rolling of the hocks in movement; may affect the animal's ability to gather and turn around.

B. Selection on the Basis of Disposition, Intelligence, and Ancestry

Intelligence is probably the most difficult attribute to measure in a horse, especially prior to any training. Although an animal may possess correct conformation, his intelligence and disposition will also influence the level at which he will perform. It has been proven that animals of certain bloodlines consistently out-perform horses of other ancestry with comparable conformation, indicating that intelligence is highly heritable. The ability of parentage to pass on to their offspring an attribute such as intelligence is known as prepotency.

Intelligence and disposition are not synonomous terms; however, they are usually closely related and are often used synonymously by horsemen. A horse can be very intelligent but have a bad disposition, but this is the exception rather than the rule. Usually an intelligent horse will exhibit a good disposition.

In considering disposition, two connotations should be discussed. The first is the disposition in terms of docility or gentleness. This is generally evident at an early age. A second connotation is the disposition in terms of try or heart as it is generally called. Some horses will give all they have and and are capable of doing, while others with the same abilities will do as little as they can get by with. Both types of disposition are usually influenced and developed mostly through handling and environment. In performance, such as racing, it is very essential that an animal be calm of disposition and have try. In short racing, unless a horse is calm in the starting gates, he will usually be beaten from the start and be unable to recover. Also, he must have try, or the heart to win.

Although an animal may inherit a high level of intelligence, it may be masked by his environment—for example, incorrect handling and training. A horse learns by habit or repetition and responds to reward as well as discipline. An animal of superior intelligence may learn quickly but become sour if his trainer should overdo it. This is the point at which the environment might tend to mask intelligence.

Since no reliable method has been developed for assessing a horse's intelligence prior to training, one should use the following as indicators in selecting: (1) check the performance records of the parentage of the animal, their ancestry, and offspring; (2) closely observe the animal's mannerisms, especially the head; the eyes and ears are good indicators of intelligence and disposition (the animal's nature, such as meanness, spookiness, etc. is most easily seen here); (3) if the animal has been trained, then observe his performance and check the reputation of his trainer.

Transparency No. 8

Quarter Horse Pedigree

The bloodline or ancestry of an individual is of more importance possibly in the selection of horses than any other breed of livestock. Although there are outstanding individuals in every bloodline, prepotency is evident in some individuals and not in others. For example: in Quarter Horse racing, Jet Deck was a highly prepotent sire of speed. Not only did he sire speed but he passed this prepotency on to his offspring, as evidenced from the performance of his get recorded on his pedigree. When selecting on pedigree, an individual should become familiar with the various families and bloodlines throughout the various breed associations, stud books, special books and articles on the various bloodlines, and by talking to competent horsemen.

C. Selection on the Basis of Sex and Age

The sex of an animal will have a direct effect upon his performance. Mares and stallions have proven to be less predictable than geldings in performance. There are exceptions, however, and the predictability of the performance of mares and stallions usually increases with age. Also, mares and stallions are necessary in a breeding operation, and those which exhibit outstanding ability in performance may be very valuable in the stud or as a broodmare.

Though geldings are preferred by most for stock horse performance purposes due to their high level of predictability, they have little value should they become crippled or unable to perform. Most trainers will agree that geldings will maintain a high level of performance longer than mares or stallions as well as being more easily managed.

The age at which a horse is trained and the level of use will usually determine his length of usefulness. The bones of a horse mature around 30 months of age, depending on his level of nutrition. Most horses which are trained after they have physically matured will remain sound until they are well past twelve years of age under normal use. A high incidence of breakdown, especially in the legs, is noted among two-year-olds that are raced extensively.

D. Selection on the Basis of Performance

The importance of the performance of ancestry has been previously mentioned. The performance of the individual animal is also very important. In most cases, the level of performance can be witnessed. It is very important that the horse's previous training fit the selector's way of riding.

Breed associations maintain records on individuals on the basis of performance in association-sanctioned competition. These performance records are extremely important in determining the value of an animal, especially from the standpoint of breeding stock.

E. Other Points to Consider in Selection

Individual preference of breed or color is important in selection. Although individuals of several breeds may be comparable with the exception of breed or color, an individual will never be as satisfied with a horse of a breed other than his preferred breed.

In selecting breeding stock, it is important to look for defects in breeding as well as in conformation. Sterility in stallions and barrenness in mares make them worthless as breeding stock regardless of their worth as performance or halter horses. Timid and slow breeders are also a problem; however, these problems can sometimes be eliminated. It is important for a veterinarian to check breeding stock if they are not well known by the individual.

There are numerous defects which appear in conformation of horses. Some are more serious than others and again the purpose for which the animal is selected has a bearing on the seriousness of the defects. It has been said many times that a horse is only as good as his feet and legs. Regardless of his use, a horse must have sound feet and legs (with the exception of outstanding individuals which have been injured), if he is to be used in breeding programs.

In order to efficiently select horses, an individual must be familiar with the common ailments and lamenesses. Some lamenesses or ailments are hereditary, as are some conformation defects, and are extremely important in selection. Some of the more common ailments and lamenesses of horses are as follows:

Transparency No. 9

1. Head:
   a. cataract (H)*—cloudy or opaque appearance of the eye
   b. poll evil—inflamed swelling of poll between the ears
2. Withers and Shoulders:
   a. fistula—inflamed swelling of withers attributed to bruising or brucellosis
   b. sweeny—atrophy or decreased size of a muscle or group of muscles usually of the hip or shoulder
3. Feet and Legs:
   a. splint—bone disease, usually on the inside of the front cannon bone, associated with mineral deficiency, strain, faulty conformation, or improper shoeing
   b. bowed tendons—enlarged tendons behind the cannon bones
   c. ringbone—bony growth on either or both sides of the pasterns

*(H) indicates a heritable trait.

d. sidebone—bony growth toward the rear quarter of the hoof head
e. navicular—inflammation and possible dislocation of navicular bone usually in the front feet
f. founder—partial or complete separation of hoof due to swelling of feet; caused by overeating, concussion, other diseases, change in ration, drinking water while too hot; characterized by turning up of hoof, rings in hooves, and various degrees of unsoundness
g. stifled—displaced patella of stifle joint
h. bone spavin—bony growth usually found on inside lower point of hock
i. hipdown—fracture of prominence of hip

4. Body:
   a. hernia (H)—rupture of umbilical or serotal area allowing internal organs to protrude
   b. heaves—difficult breathing due to lung damage
   c. roaring—difficult breathing due to obstruction usually in the lungs

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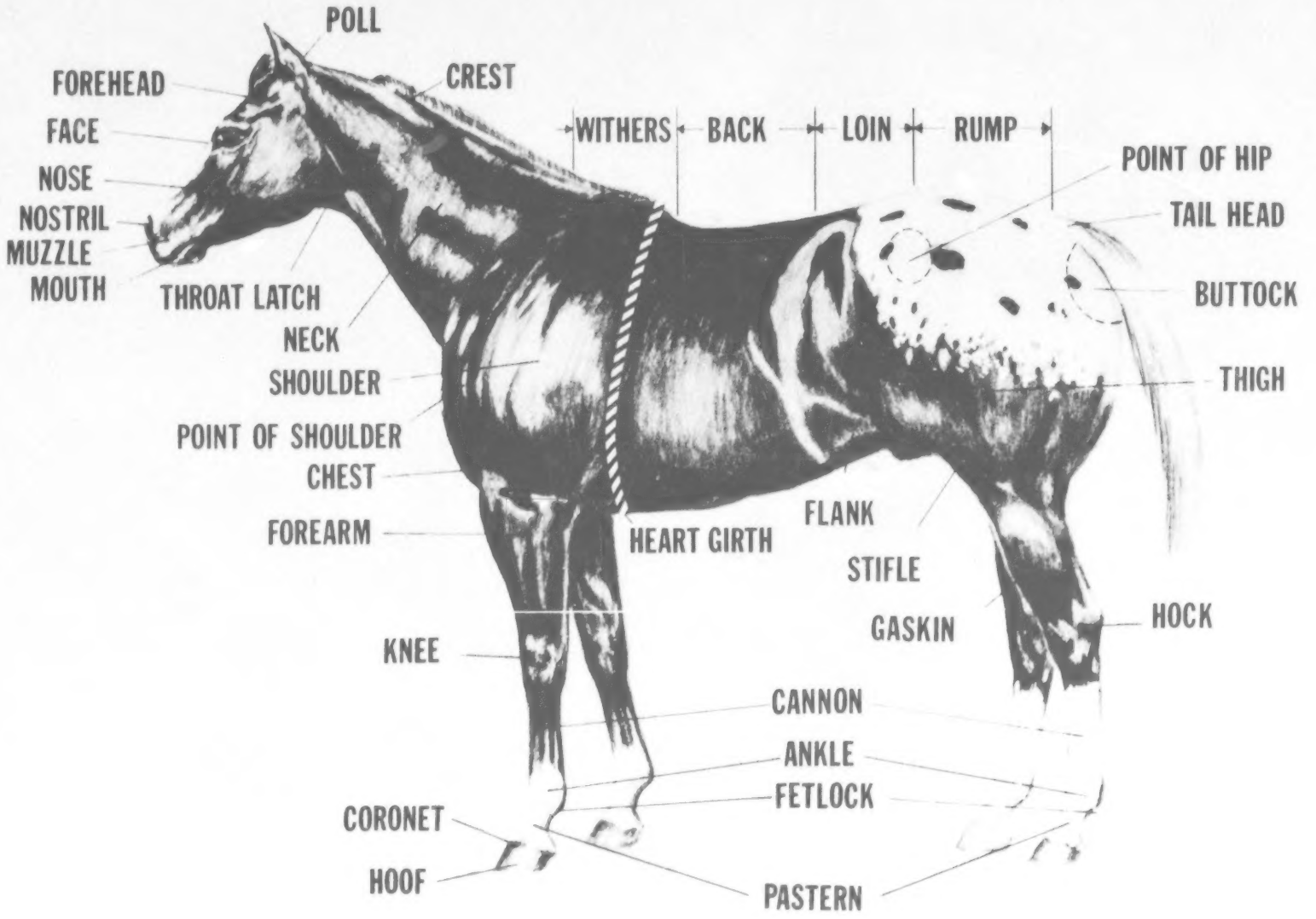
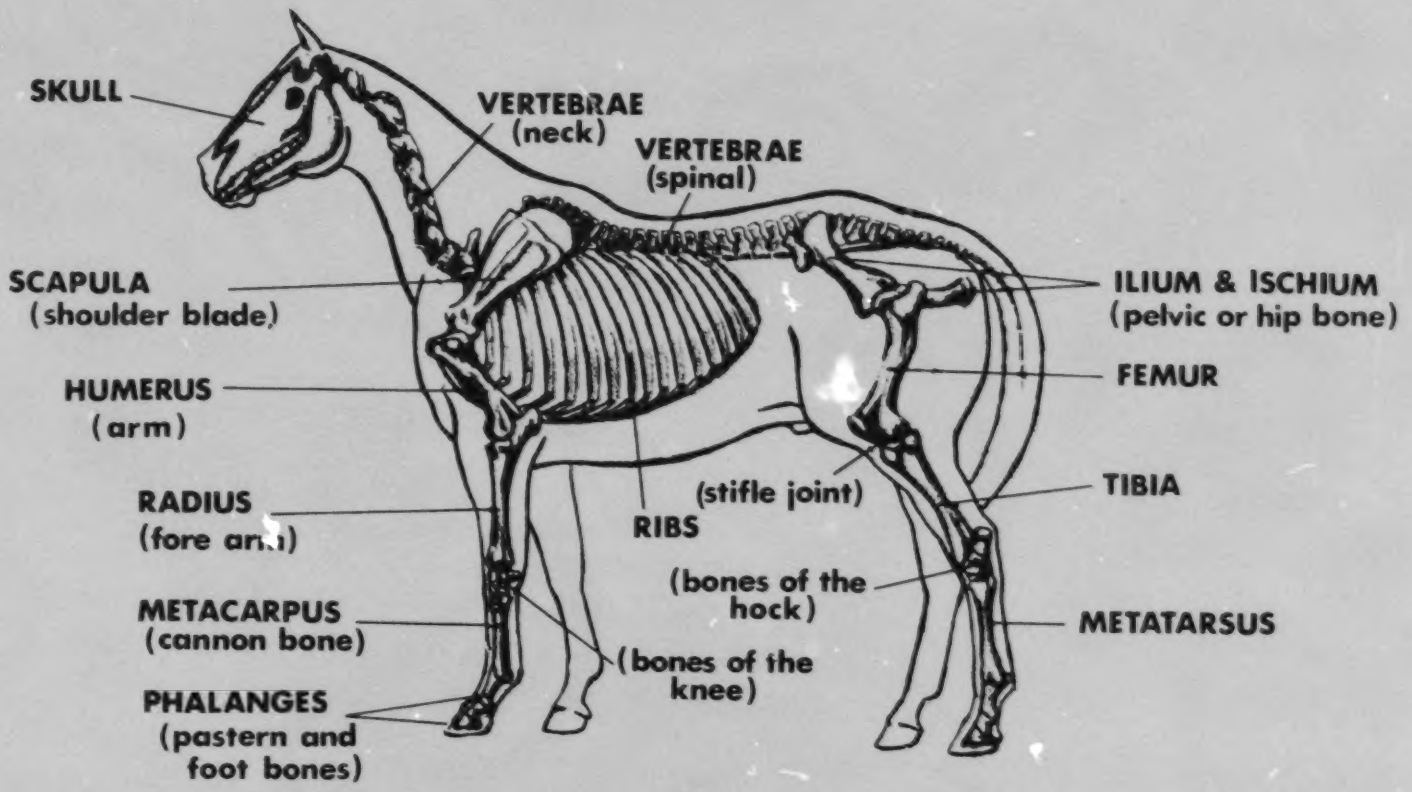
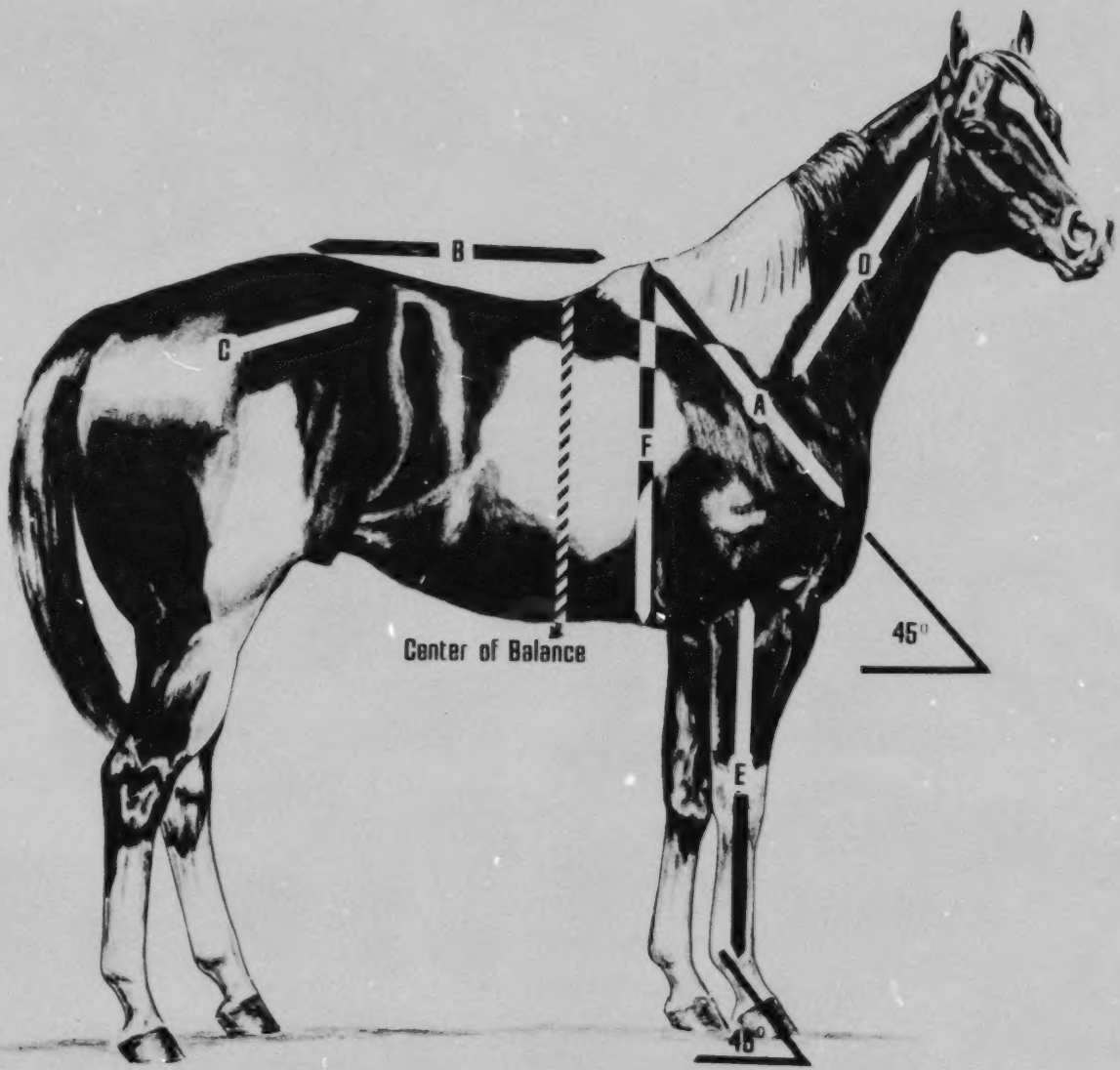
PARTS OF THE HORSE



SKELETAL SYSTEM OF THE HORSE



Correct Balance In Conformation



IDEAL STOCK HORSE CONFORMATION

FRONT VIEW

SIDE VIEW

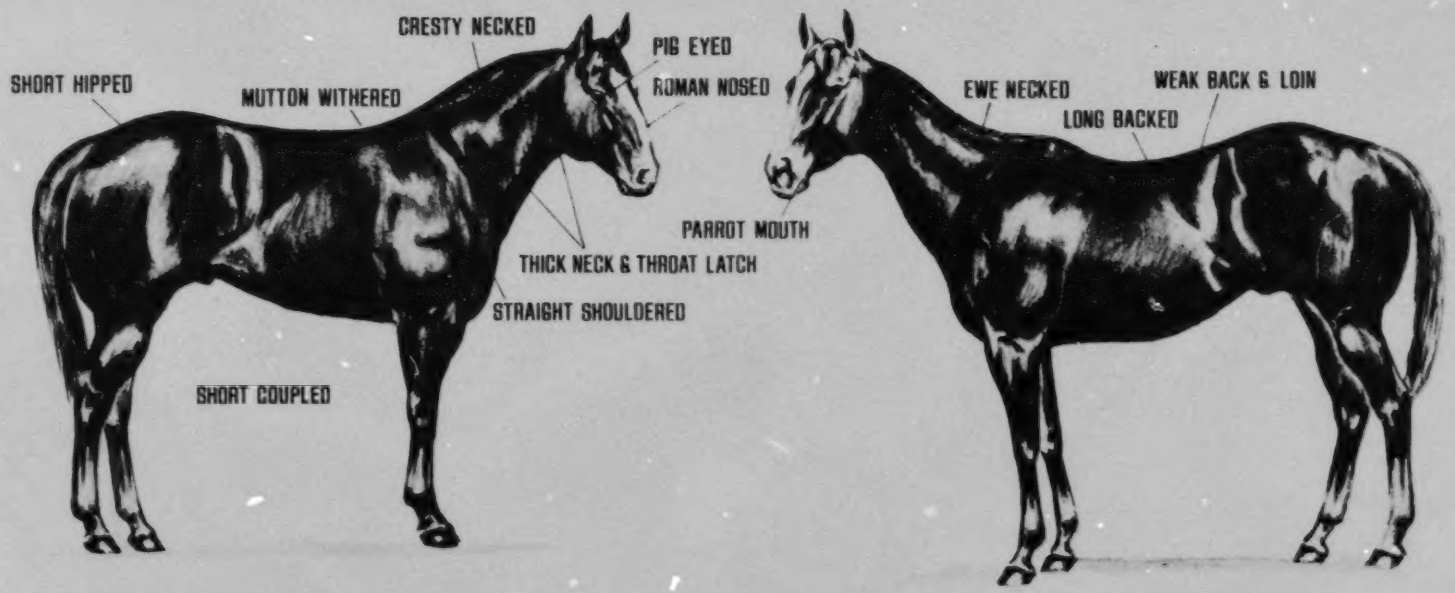
REAR VIEW

V-A-1

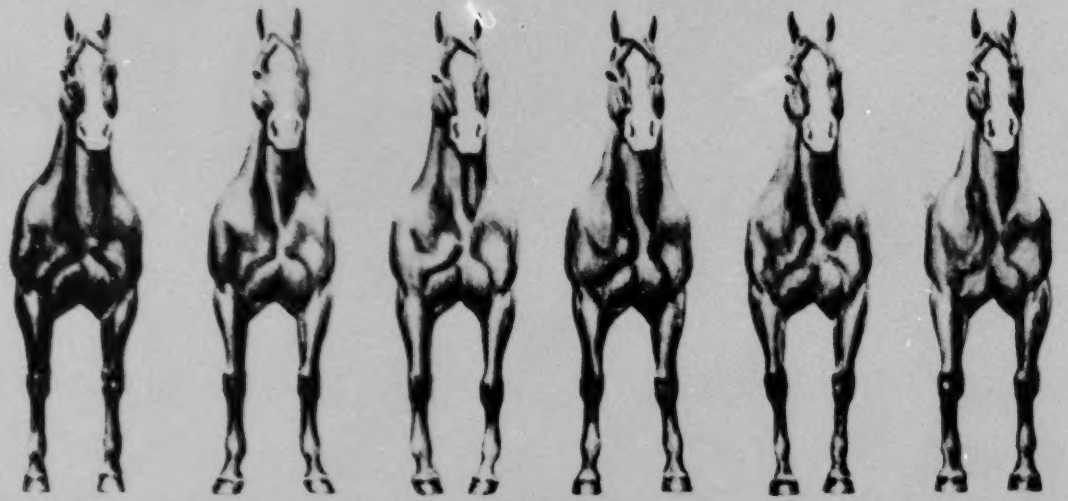
II-A-8c
No. 4

COMMON CONFORMATION DEFECTS

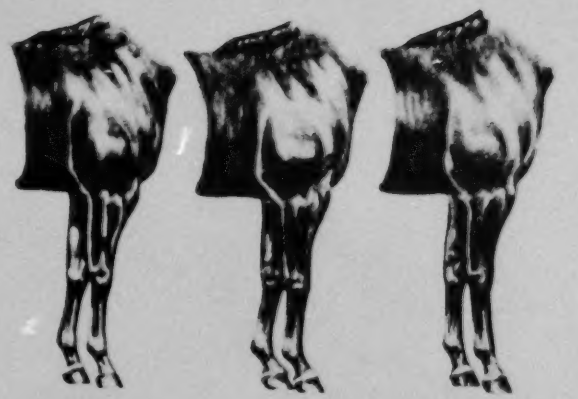
(head, neck and body)



COMMON CONFORMATION DEFECTS (front legs)



CORRECT | SPLAY FOOTED | PIGEON TOED | BASE WIDE | BASE NARROW | OFF IN THE JOINTS

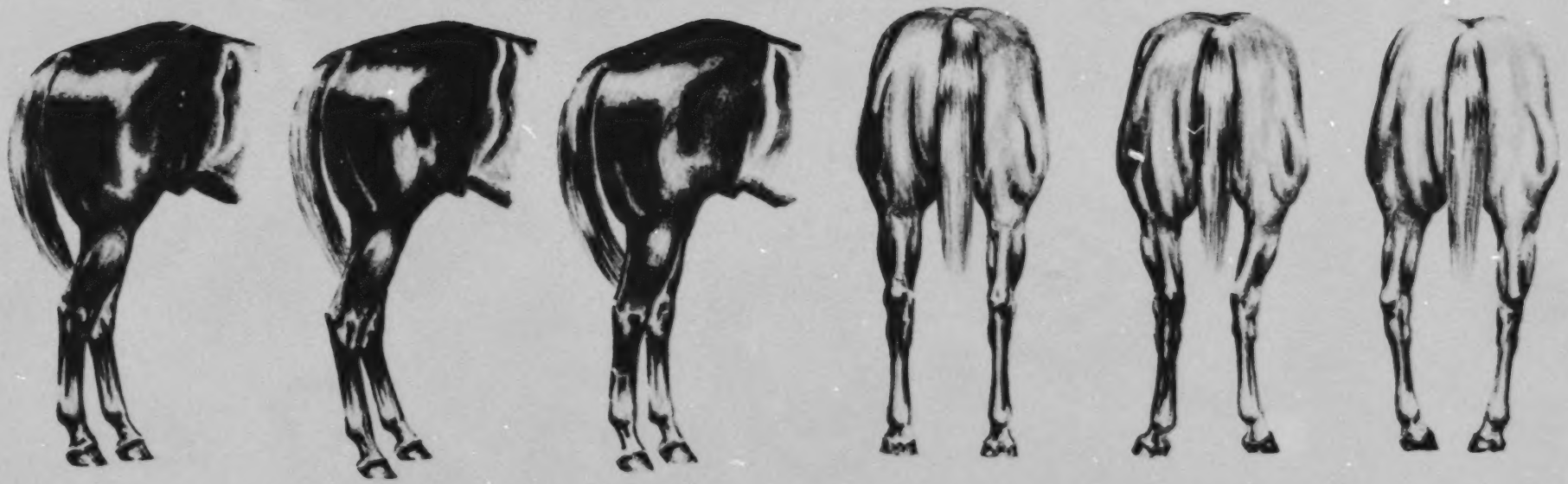


CORRECT | BUCK KNEED AND COON FOOTED | CALF KNEED AND STRAIGHT PASTERNS

V-A-1

II-A-8c
No. 6

COMMON CONFORMATION DEFECTS (hind legs)



CORRECT | SICKLE HOCKED | POST LEGGED | CORRECT | COW HOCKED | BANDY LEGGED

V-A-1

II-A-8c
No. 7

QUARTER HORSE PEDIGREE

Sire

JET DECK AAAT

MOON DECK — TOP DECK (TB)

MOON DECK — MOONLIGHT NIGHT

Dam

MISS NIGHT BAR — BARRED

MISS NIGHT BAR — BELL OF MIDNIGHT

1960 Bay Stallion

RACING RECORD:

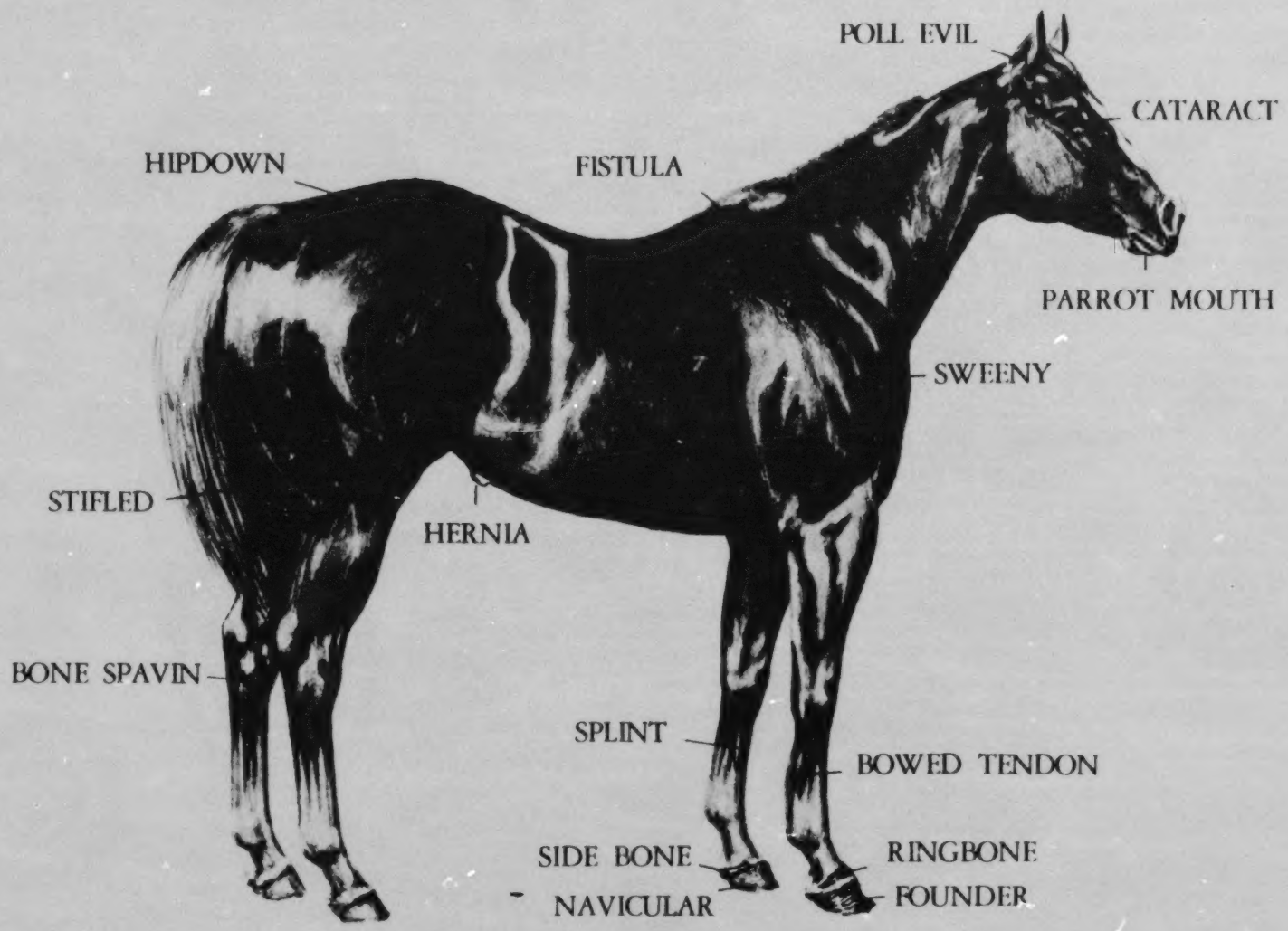
1962 - Champion Stallion, Champion Two Year-old Colt

1963 - World Champion Quarter Running Horse, Champion Stallion, Champion Three Year-old Colt

31 starts, earned $ 200,625 and 42 racing points: 22 wins, 4 seconds, 2 thirds

In 1970, at the time of his death, he had sired 114 ROM qualifiers, 22 AAAT, 50 AAA, and 42 AA

COMMON AILMENTS AND LAMENESSES of the horse



ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 8d: Selecting Sheep

*Terms: All terms underlined are in the "Glossary of Terms."

Note: See Topic 10a for factors to consider in determining the "Type of Producer" and "The Selection of a Breed."

I. Selecting Sheep Types

Before going into the sheep business, a prospective producer should be sure that he likes sheep, that he understands their peculiarities, and that his farm or ranch is adapted to sheep production.

Since there are several types of sheep, several methods of production, and since sheep are a multiproduct animal, producing wool, meat, and pelts for furs, a prospective producer should determine the production methods he is going to follow before selecting the individual animals. There are two kinds of sheep producers in Texas: the farm flock producer and the rancher. Several systems of production are used by both kinds of producers.

Because of their herding instinct, fine wool sheep are better adapted to the open range; therefore, they should be selected for range production. Mutton breeds or medium wool breeds tend to do better under farm flock conditions, so these breeds, or a cross of the medium wool and the fine wool breeds, should be selected for farm flock production.

II. Criteria for Selecting Sheep

The criteria used for selecting sheep will vary according to the use for which the animal is intended. Generally sheep are selected for the following purposes: (1) breeding sheep, with mutton production as the primary objective; (2) breeding sheep, with wool production as the primary objective; (3) feeder lambs for the feedlot; or (4) slaughter lambs for the market (including show lambs).

Thus, when mutton production is the primary objective, attention is given to producing heavy weaning lambs of acceptable grade and type. When sheep are selected for wool production, the clean weight and quality of fleece are of primary importance. Selection of feeder lambs is based on desirable type and quality, health and vigor, and predicted performance in the feedlot. Slaughter lambs are selected for the market using conformation, finish, and estimated quality and yield of carcass as the criteria in determining value.

Selecting sheep requires a trained hand as well as a trained eye. Since sheep have a covering of wool on their bodies most of the time, the buyer must feel of the animal to accurately determine its conformation. After he has gained experience in selecting sheep in-the-wool, he will experience little difficulty in determining conformation.

Because the fine wool producer receives a part of his income from the sale of lambs and the medium wool producer receives a part of his income from the sale of wool, selection—regardless of breed and method of production—should be based on (1) conformation and wool, (2) production records, (3) pedigree, and (4) health and vigor. However, a producer is seldom able to base his selection on all of the above factors.

A. Selection Based on Conformation

The selection or judging of sheep differs from other forms of livestock because two products of economic importance are involved instead of one. In some instances, both meat and wool must be given consideration. While one must use both the eye and the hand to judge, a general idea of the conformation may be gained by sight alone.

1. Body Conformation
If the student has developed a mental picture of the ideal conformation of a beef animal, it should be rather easy for him to develop a mental picture of the ideal conformation of a sheep, as the conformation of both is similar.

Transparency No. 1

The first step in preparation for selecting or judging sheep is to become familiar with the language that describes or locates the parts of a sheep.

Transparency No. 2

In order to relate desirable conformation to the finished market product, it would also be helpful to be familiar with the wholesale cuts of lambs.

Transparency No. 3

The second step in selecting sheep according to conformation, regardless if they are commercial or purebred, is to have an ideal or standard in mind and then select accordingly.

As in selecting other livestock, the procedure for judging sheep according to conformation is to survey the animal at a distance of about 20 feet from the front view, side view, rear view, and then handle the animal in the contact step.

a. Front view: From the front view, the animal should be free of excess skin and finish in the throat and chest area. The chest should be wide and clean and set back into the body to give the animal constitution and capacity as well as the clean, trim, muscular look desired in the modern day "meat type" lamb. The head should be reasonably refined and should possess some quality and character. The front legs should set out wide on the corners of the body and should indicate above average substance of bone. A coarse head and excessively wide, heavy front are undesirable. However, a narrow chest with the front legs close together indicates a lack of ruggedness and constitution.

b. Side view: From the side view, length and ruggedness of body to go along with the desired size and scale are important in yielding carcasses with the largest proportion of the weight in the leg, loin, and rack regions. Extremely short-bodied, compact animals or extremely shallow-bodied animals are undesirable. Extra length of rib, loin, and especially extra length of rump are particularly important in contributing to a larger leg and more weight in the hind saddle.

The animal should be strong-topped, neat and clean in the fore and rear flanks, and trim and tight through the chest region and along the underline. The length of leg should be in proportion to age, growthiness, and stage of maturity. The feet and legs should be placed squarely on all four corners of the animal's body, and the animal should stand on adequate substance of bone for his size and structure.

c. Rear view: The animal should be extremely long in the rump and full and level out over the dock. This extreme thickness should carry down into a deep, thick, full, firm, muscular leg. The rear legs should set wide apart to permit the presence of the muscle volume desired in "meat type" lambs. A close stance on the rear legs and a narrow, pinched rump contribute to a lack of balance and less weight in the hind saddle.

d. Condition and handling: In the contact step, as one approaches the animal to be examined, the topview should reveal a "coke bottle" shape—a reasonably slim, clean neck that blends neatly into the shoulders, with a slight prominence at the shoulders which is due to a muscular shoulder, arm, and forearm. The animal should be slightly tight and free from excess fat in the heart area and should have more spread and spring to the rear rib than the fore rib, carrying this extra spread and thickness back into the loin.

A long, level topline, a trim, tight middle, and a definite degree of cleanness and firmness in the rear flank and crotch regions add to the attractiveness and style of the lamb. A heavy, wasty middle tends to allow more excessive fill and thus reduces yield of the carcass and dressing percentage.

By observing and handling the animal, one can determine rather quickly whether it is extremely fat or thin. Parts of the sheep handled are over the backbone and ribs; along the edge of the rack, back, and loin; and over the hips and across the dock. The hardness or firmness of the animal over the back and loin is also used for determining condition, particularly in grading, to distinguish between an average lamb and a top quality market lamb. In handling over the spinal column or ribs, the fingers should be extended together rather than spread so that one does not get a separate "feel" from each finger. Also, the fingers should be pressed firmly (through the fleece if not shorn) to the flesh or bone. Digging in with the points of the fingers back and forth is a poor technique that is not only a waste of effort and time but also hard on the sheep.

By pressing the hands against the animal's body over the rack, back, and loin, one can also determine the desirability of the width and muscling in these areas.

2. Wool

The degree of emphasis placed on wool by the producer varies with the type of sheep being selected. The general rule in determining the value of wool, using 100% for a total of all factors, is as follows:

5% to 15% for medium wool breeds
25% for long wool breeds
30% for crossbred wool breeds
40% to 60% for fine wool breeds

Transparency No. 4

The major factors considered in the evaluation and classification of wool are: fineness, staple length, density, and clean wool yield.

Fineness or diameter of fiber is the primary factor on which commercial grades of wool are based. Fleeces classified under the U. S. system with regard to fiber diameter are referred to from finest to coarsest as: Fine, 1/2 Blood, 3/8 Blood, 1/4 Blood, Low 1/4 Blood, Common, and Braid. The word "blood" is a wool-grade term once associated with the breeding of sheep; however, today this is no longer true. The British system, or Spinning Count, is a numerical rating plan based on the amount of yarn that can be spun from one pound of clean wool. This system provides a more precise designation for diameter of fiber and is used almost entirely by mill buyers. The spin count values that correspond to the various blood grades are shown in Table 1.

TABLE 1

PHYSICAL FACTORS AND STANDARDS AFFECTING WOOL VALUE

U. S. Blood	Spinning Count	Staple Length in inches	Crimps per Inch in the Staple	Shrink
Fine	64's, 70's and 80's	over 2 3/4	14-22	56-61
1/2 Blood	60's & 62's	over 3	10-14	53-59
3/8 Blood	56's & 58's	over 3 1/4	8-10	47-53
1/4 Blood	50's & 54's	over 3 1/2	5 - 8	44-50
Low 1/4 Blood	46's & 48's	over 4	2 - 5	42-48
Common	44's	----------	0 - 2	35-40
Braid	36's & 40's	----------	0 - 1	35-40

Staple length contributes to the quantity of wool and the loftiness of "fleece volume" and is reflected in clean fleece weight. Thus, length of fiber contributes to the value of wool for the producer and is a factor to be considered in selection. Distinct and even crimp is desirable throughout the entire fiber length.

Density refers to the number of fibers grown in a given area of skin. Fleece density is not uniform over the body of a sheep and usually conforms to a pattern—the density being greatest around the line of the spine and decreasing toward the belly. Uniform fleeces require less sorting into different categories and are preferred by woolen mills.

Clean wool yield is the percentage of clean wool remaining after all foreign material has been removed by washing and scouring. Shrinkage and price of wool vary with the content of grease, tags and dung locks, dirt, burrs, straw, etc.

Other factors that affect the general appearance or desirability of wool for processing and contribute to determining the value of the wool include color, character, and wastiness.

Bright, white to cream-colored fleeces are most desirable. Gray or dull-colored fleeces are penalized, particularly if they include excessive amounts of black fibers.

Character traits such as parallel arrangements of fibers and large or "bold" locks of wool improve the general appearance or eye appeal of fleeces and also improve the spinning qualities for manufacturing. Unsoundness and "second cuts" are the principal items contributing to wastiness. Wool fibers should be strong and elastic. Healthy, properly fed sheep usually produce sound wool. "Second cuts" may occur as a result of improper shearing.

In observing the fleece and skin, part the wool well down on the shoulder, side, and leg. Use the back of each hand with the palm held up, and open the part in order to reflect light onto the fleece. Animals showing dark blue skins with paleness in the linings of the nose and eyelids should be regarded with suspicion.

B. Selection Based on Production Records

Possibly because of the limited area in which sheep are produced and the small percentage of farmers and ranchers that produce sheep (7.5% in Texas), there has been less production testing of sheep than of other classes of livestock. Other than individual flock tests, the only production testing of sheep being done in Texas has been at the Sonora Experiment Station. Physical characteristics measured or scored at the Sonora Station are average daily gain, face covering score, belly score, and conformation score. Fleece data being obtained are grease fleece weight, clean fleece weight, staple length, and fiber diameter.

Even though there has been very little production testing of sheep, production records are a good indication of a sheep's productive ability, and, when possible, selection should be made from flocks with production records.

Transparency No. 5

The results of an experiment which involved 75 ranchmen with sheep producing wool of similar quality indicated that a selective breeding program provided several benefits. The sheep were more uniform in appearance and wool production. Another improvement noted from selective breeding was the increased percentage of lamb crop. In addition to increasing the percentage of lamb crop, the animals became better suited to the range conditions under which they were being produced.

Transparency No. 6

Production Record Forms
Commercial Flock Record
Individual Record for Rams
Individual Record for Registered Sheep

C. Selection Based on Pedigree

Not as much importance is placed on the pedigree as a basis of selection of sheep as there is in other classes of livestock. Instead of using family names, as is done by many breed associations of other classes of livestock, many sheep breed associations use numbers to designate the registered animal. When the pedigree is used as a basis of selection, the ancestry "close up" in the pedigree should be observed. An outstanding ancestor in the pedigree would be a factor for consideration.

D. Health and Vigor as a Basis for Selection

Health and vigor of breeding sheep and feeder lambs is of utmost importance. In making selections, animals that appear thin and listless or those that show dark skins or paleness in the lining of the nose and eyelids are poor choice.

When selecting breeding ewes, one should be observant not to select old ewes with broken mouths or those with unsound udders. A sheep with either jaw protruding beyond the other will have difficulty in grazing. Any ewe that appears enlarged or heavy directly below the rear flank possibly has a weak abdominal wall and should not be selected as a producer.

Only large, smooth, vigorous, healthy ewes should be selected.

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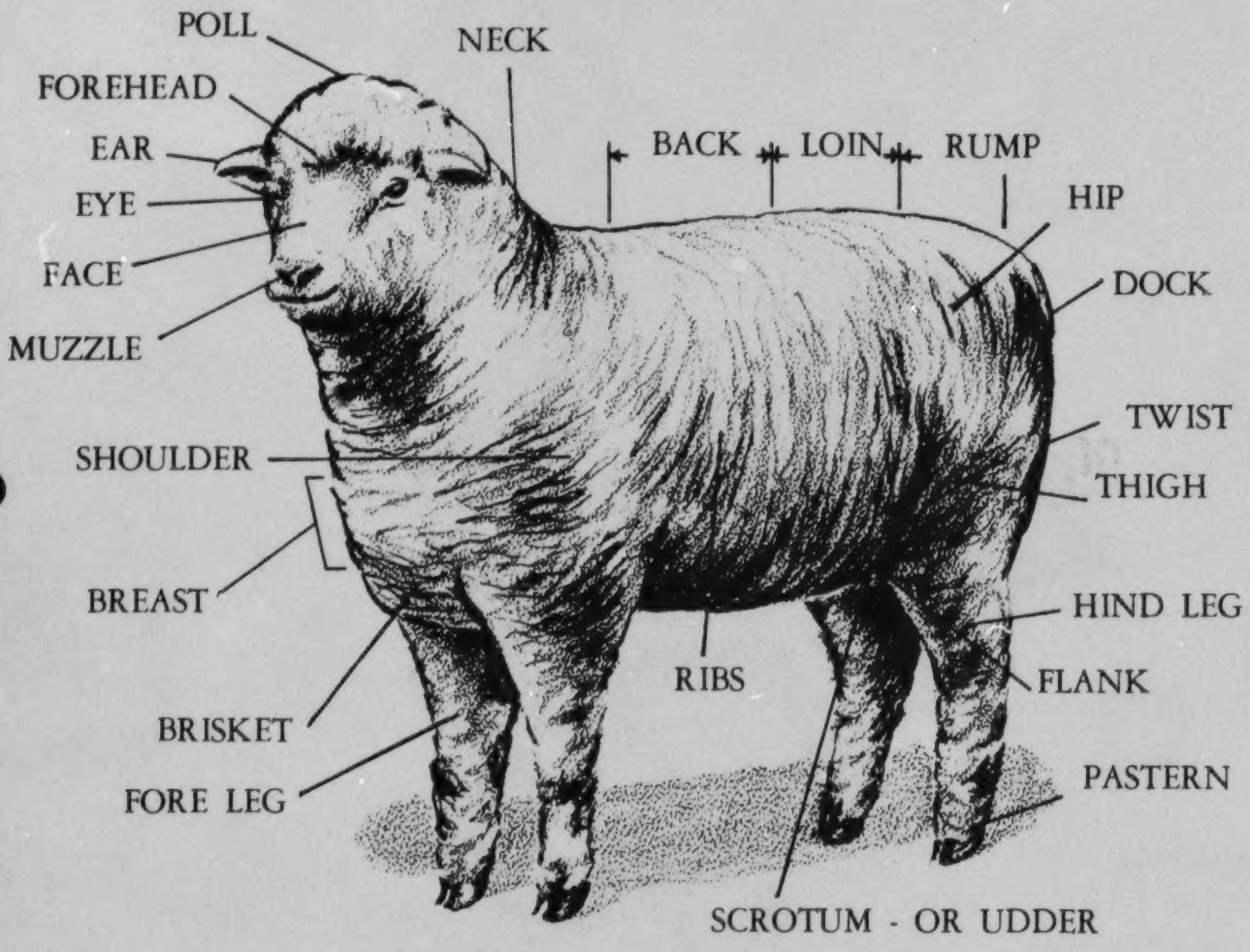
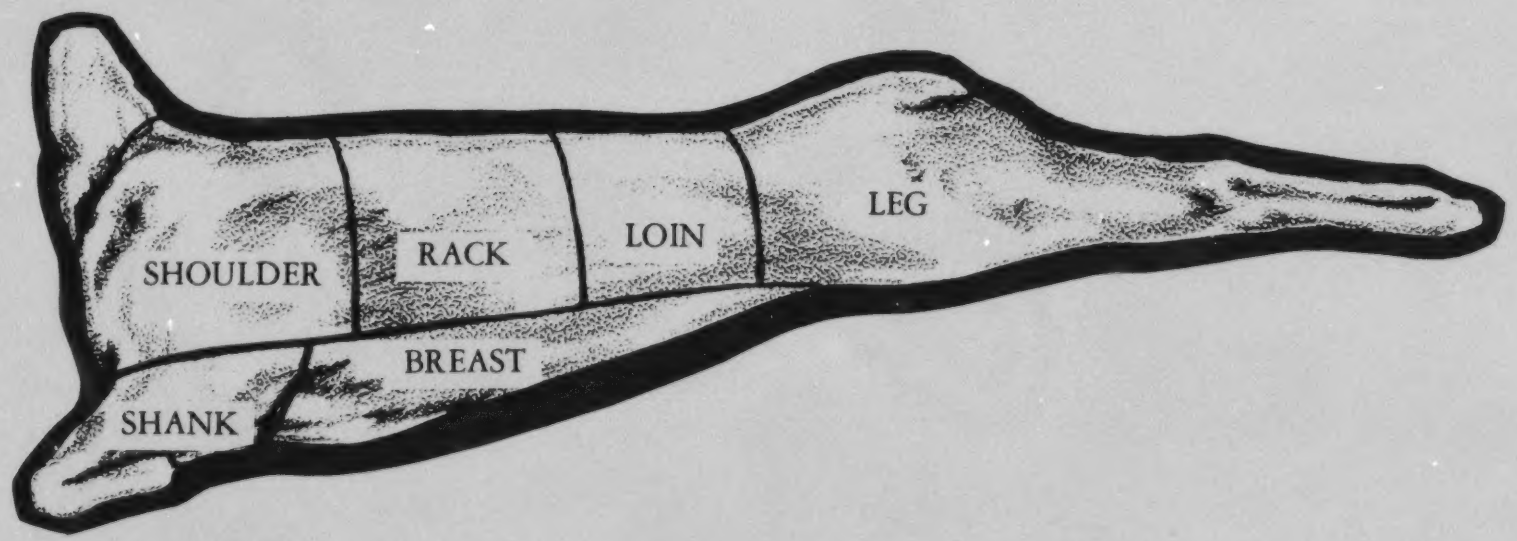
PARTS OF A SHEEP

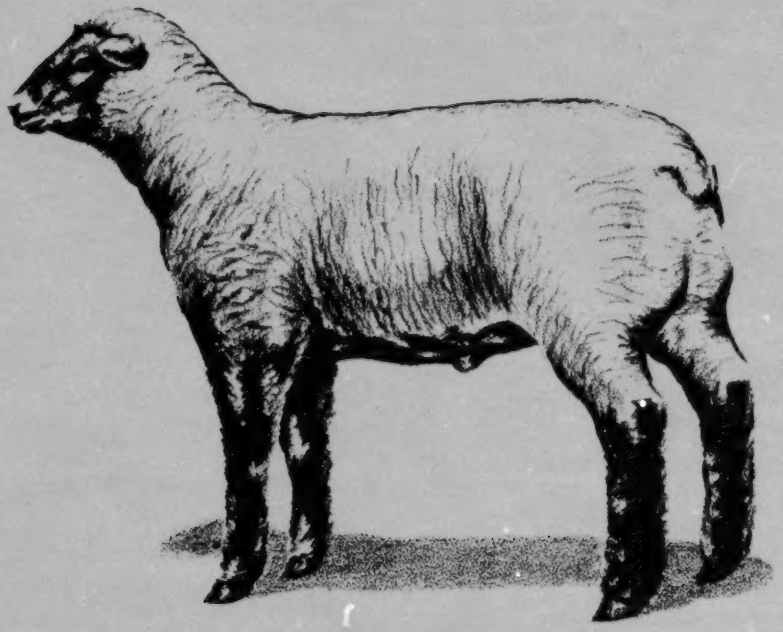


WHOLESALE CUTS OF LAMB



IDEAL CONFORMATION

FRONT VIEW



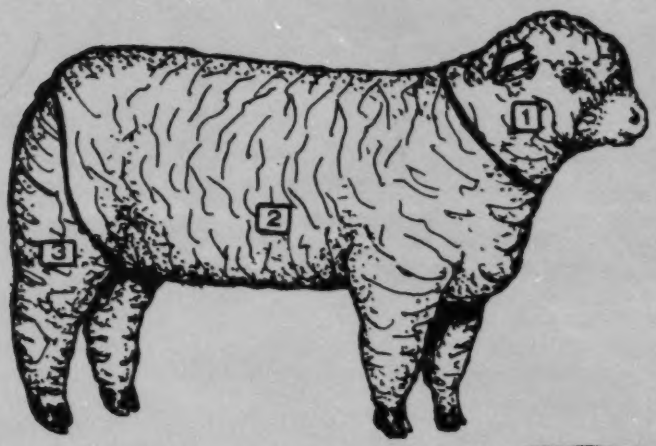
SIDE VIEW

REAR VIEW

V-A-1

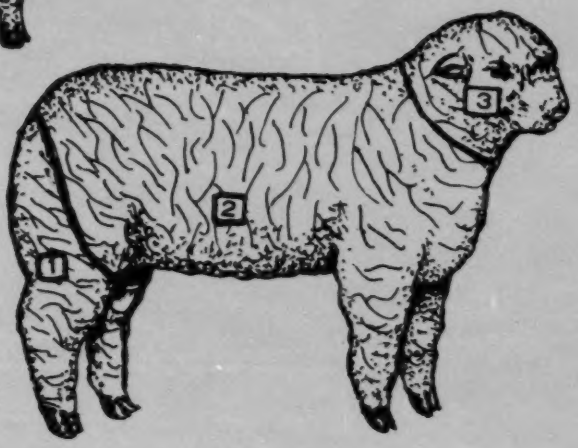
II-A-8d
No. 3

BODY VARIATIONS OF WOOL FINENESS, LENGTH, DENSITY, AND CLEAN WOOL YIELD.



FINENESS

LENGTH



DENSITY

CLEAN WOOL YIELD

SHEEP HERITABILITY ESTIMATES

TRAIT	AVERAGE PERCENT
FACE COVERING	50
STAPLE LENGTH	45
GREASE FLEECE WEIGHT	40
WOOL FIBER FINENESS	40
YEARLING WEIGHT	40
MILK YIELD	30
BIRTH WEIGHT	30
WEANING WEIGHT	30
MULTIPLE BIRTHS	10
CONDITION (FAT)	10
CONFORMATION	9

COMMERCIAL FLOCK RECORD

DATE _____

DESCRIPTION	NUMBER OF HEAD	TOTAL POUNDS OF WOOL	AVERAGE FLEECE WEIGHT	AVERAGE PERCENT LAMB CROP WEANED	AVERAGE WEANING WEIGHT OF LAMBS	AVERAGE WEIGHT OF LAMBS SOLD	REMARKS
TOP EWES MIDDLE EWES BOTTOM EWES REPLACEMENT YEARLINGS BUCKS							

INDIVIDUAL RECORD FOR RAMS

DATE _____

NUMBER	LENGTH OF STAPLE	WEIGHT OF FLEECE	SHORN BODY WEIGHT	REMARKS

INDIVIDUAL RECORD FOR REGISTERED SHEEP

DATE _____

NUMBER	LENGTH OF STAPLE	WEIGHT OF FLEECE	SHORN BODY WEIGHT	WEANING WEIGHT OF LAMBS	REMARKS

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 8e: Selecting Swine

*Terms: All terms underlined are in the "Glossary of Terms."

Note: See Topic 10a for factors to consider in determining the "Type of Producer" and "The Selection of a Breed."

I. Considerations for Swine Breeding Programs

Because of a decrease in the demand for lard and a demand by housewives for lean pork, producers have had to change from the over-fat, lard type hog to the lean, meat type hog which produces a maximum of quality pork with a minimum of waste and trim.

Considering the length of time pork producers have spent attempting to change the type of hogs, a person unfamiliar with the type being produced today would think that all hogs are of meat type; however, it is estimated that 75% of the hogs marketed are wasty and over-fat.

Swine producers can produce more muscular hogs with less fat by following a planned selection and breeding program. Such hogs are more valuable on today's market, and their lean, tender cuts find favor with the consumer.

This meat-type market hog can be produced by selecting gilts and boars that have good length (30-inch carcass on a 200-pound hog) with thick, muscular conformation, and just enough fat to insure carcass firmness and to give quality and flavor to the cuts.

II. Selecting Individual Animals

As is true in all classes of livestock, selection of swine breeding stock is a constant process for the breeder. The four bases for selecting swine are type, production testing, pedigree, show-ring winnings, and health, vigor, and disposition.

A. Selection Based on Type and Conformation

There is a close relationship between the conformation of a meat-type hog and its production traits such as backfat thickness and litter size. The first essential to a profitable pork program is large litters of pigs raised to weaning age. These pigs must be fast-growing, able to convert grain and supplement into pounds of pork at an efficient rate, and possess other traits that are profitable for the producer.

Transparency No. 1

There is some disagreement among swine breeders as to what is meant by meat type, but most agree that a meat-type hog will have the following characteristics:

1. Yield 50% of live weight in primal cuts: Ham, Loin, Picnic, and Boston Butt
2. Weigh 200-210 pounds at 5½ months of age
3. Backfat thickness less than 1.5 inches
4. Loin eye four square inches or more
5. Feed conversion of one pound gain to 3.5 pounds or less of feed
6. Females produce and raise eight or more pigs per litter

Transparency No. 2

Selection based on type or conformation implies the selection of animals that most closely approach the ideal and the culling of those that fall short of these standards.

In order for the person(s) making the selection to properly describe the hog, he should learn the parts of a hog.

Transparency No. 3

Market hogs weighing from 180 to 200 pounds will yield about 45.5% of their live weight in the four primal cuts: shoulder, loin, bacon, and ham. Yet, because of the higher value per pound of these primal cuts, they represent approximately 75% of the retail value of the hog. For this reason, one should learn the four primal cuts of the pork carcass and the area from which these cuts are produced.

Of the four primal cuts mentioned, about 23% of the hog carcass is untrimmed shoulder, the loin is approximately 20%, the marketable bacon represents about 17%, and the ham represents from 22-28% of the weight of the carcass.

Transparency No. 4

The next essential step in selection or judging is to have the ideal animal clearly in mind.

The meat-type hog will have an even arch over a strong-muscled back, a trim jowl, trim underline, and a firm finish. He will have good width between the front and hind legs.

The most important criterion in determining whether a hog is truly meat-type is the amount of muscling as indicated by a high lean-to-fat ratio.

On the basis of U.S.D.A. Grades the expected yields of the four primary wholesale cuts based on chilled carcass weight are as follows:

Grade	Yield
U. S. No. 1	53% and over
U. S. No. 2	50% to 52.9%
U. S. No. 3	47% to 49.9%
U. S. No. 4	Less than 47%

In selecting or judging hogs on type and conformation, one would follow a system similar to that recommended for selecting other classes of livestock. The recommended order of observation is Step 1, side view; Step II, rear view; Step III, front view; and Step IV, contact step. The animal should be observed from a distance of 20 feet in the first three steps. The fourth step may be used to inspect characteristics that cannot be inspected from a distance. This system should be followed each time in hog selection.

When selecting breeding stock, one should select animals with the same characteristics as a desirable market hog. In addition, the underline should be observed on all breeding stock before an animal is purchased. Teat placement and blind teats should be observed on gilts and sows, and the rudimentaries should be observed on boars. Both sexes should have a minimum of twelve evenly spaced, well developed teats. Animals selected for breeding stock should also stand on sound feet and legs.

B. Production Records as a Basis of Selection

The first program initiated to test swine in order to determine their productive ability was established by one of the major breed associations in 1938. A single set of rules was adopted by all the major breed associations for production testing in 1946; however, there are some differences in the characteristics tested and method of testing used by breed associations today.

No single selection plan fits all breeders and producers, but sound production information coupled with competent visual appraisal permits the most accurate selection of breeding animals.

Any profitable selection program must be based on the ability of an animal to perform. This opinion is reflected in the wider acceptance and use of Production Registry, breed Meat-Type Certification Programs, and "On-the-Farm" Performance Testing and Gilt Selection Programs.

Production Registry, one of the programs used to test the productive ability of swine, generally is concerned with testing the following characteristics:

a. Number of pigs farrowed—For an animal to be registered, it must be from a litter of eight or more pigs, and these pigs must be raised to 56 days of age.
b. Litter weight—To qualify for Production Registry, the litter farrowed from a gilt must weigh 275 pounds and a sow's litter 320 pounds at 56 days of age. This requirement will give a better indication of the sow's mothering ability.
c. Birth weight—This is another characteristic used by some breed associations for Production Registry.

For a sow to qualify for Production Registry, she must produce two litters that meet the requirements; the boar must sire several production registered daughters to qualify as a Production Registry sire.

After being admitted for Production Registry, the litter is ready to be tested as a Certified Litter. To be certified, the pigs in the litter must meet the following qualifications:

a. Two pigs from the litter must weigh 200 pounds each at 170 days of age.
b. These pigs must have 1.5 inches of backfat or less.
c. The carcass of each pig must measure 29 inches from the first rib to the aitch bone.
d. The loin muscle must be at least four square inches at the tenth rib.

The mating of a certified sow to a certified boar is known as certified mating, and the letters PR, CMS, and CL are included on the registration papers of swine qualifying for Production Registry, Certified Meat Sire, and Certified Litters.

The "On-the-Farm" selection program is based on litter records, rate of gain, and meatiness as determined by backfat probing. It is one of the most highly effective programs for selecting more muscular, more profitable gilts.

Transparency No. 5

This "Sow Record Form" used by the Texas Agricultural Extension Service is a sample of the type of record used with the "On-the-Farm" selection program.

Transparency No. 6

Another performance factor to consider in selecting breeding hogs is the heritability of some of the economically important traits. Much improvement can be made in traits with high heritability (carcass traits) through individual selection of superior boars and gilts. Traits which are less than 30% heritable, such as litter size, respond little to individual selection. The traits which are low in heritability are improved most through management, such as crossbreeding, proper nutrition, and health.

Transparency No. 7

Summary of Performance and Carcass Data—Texas A&M University Litter Testing Program, 1967

C. Pedigree as a Basis of Selection

The pedigree, when used as a basis for selecting breeding swine, provides a record of the animal's ancestry. For animals that qualify for Production Registry, Certified Meat Sire, and Certified Litter, the pedigree indicates that the animals have qualified as designated by the letters PR, CMS, and CL on the registration certificate. A recognized pedigree which carries impressive production records lends confidence in projecting how well young animals will perform when selected as breeding stock. However, it is noted that mere names and registration numbers are meaningless unless the superior individuals and outstanding producers are close up in the lineage.

The breeding boar should always be purebred and of known ancestry. In addition, he should be a good representative of the breed selected. Breeding sows should be of good ancestry, whether they are purebreds, grades, or crossbreds. Again, if pedigree selection is to be of utmost value, one should be familiar with the individual animals which make up the pedigree.

D. Show-ring Winnings as a Basis of Selection

A principal value of selections based on show-ring winnings may be that shows direct the attention of the amateur to the types and bloodlines of hogs that are currently meeting the approval of the better breeders and judges. In most cases, the selection of breeding hogs on the basis of show-ring winnings has been for the good; however, attention should be given to the type of animals that are winning the shows to determine whether such animals are efficient from the standpoint of a producer.

E. Health, Vigor, and Disposition as a Basis of Selection

A good policy to use in selecting hogs—as in selecting all livestock—is to purchase individuals that are large for their age and in good health. The prospective producer should purchase breeding stock from a reputable breeder who maintains a good sanitation program and a disease-free herd. Another important consideration is to select animals that have been vaccinated for all the diseases common to the area prior to purchase.

Since the disposition of the sow will affect the number of pigs saved at farrowing time, the producer should select animals that have a quiet disposition. Quiet, gentle animals generally have such a disposition.

REFERENCES:

1. Bundy, Clarence E. and Ronald V. Diggins, Swine Production, Prentice-Hall, Inc., Englewood Cliffs, NJ.

2. Ensminger, M. E., Animal Science, The Interstate Printers and Publishers, Inc., Danville, IL.

3. "Keys to Profitable Swine Production," MP-953, Texas Agricultural Extension Service, Texas A&M University, College Station, TX.

4. Meat Evaluation Handbook, National Livestock and Meat Board, Chicago, IL.

5. "Selecting Meatier Hogs," B-922, Texas Agricultural Extension Service, Texas A&M University, College Station, TX.

CHARACTERISTICS OF MEAT TYPE HOGS

1. YIELD 50% OF LIVE WEIGHT IN PRIMAL CUTS: HAM, LOIN, PICNIC, AND BOSTON BUTT

2. WEIGH 200 TO 210 POUNDS AT 5½ MONTHS OF AGE

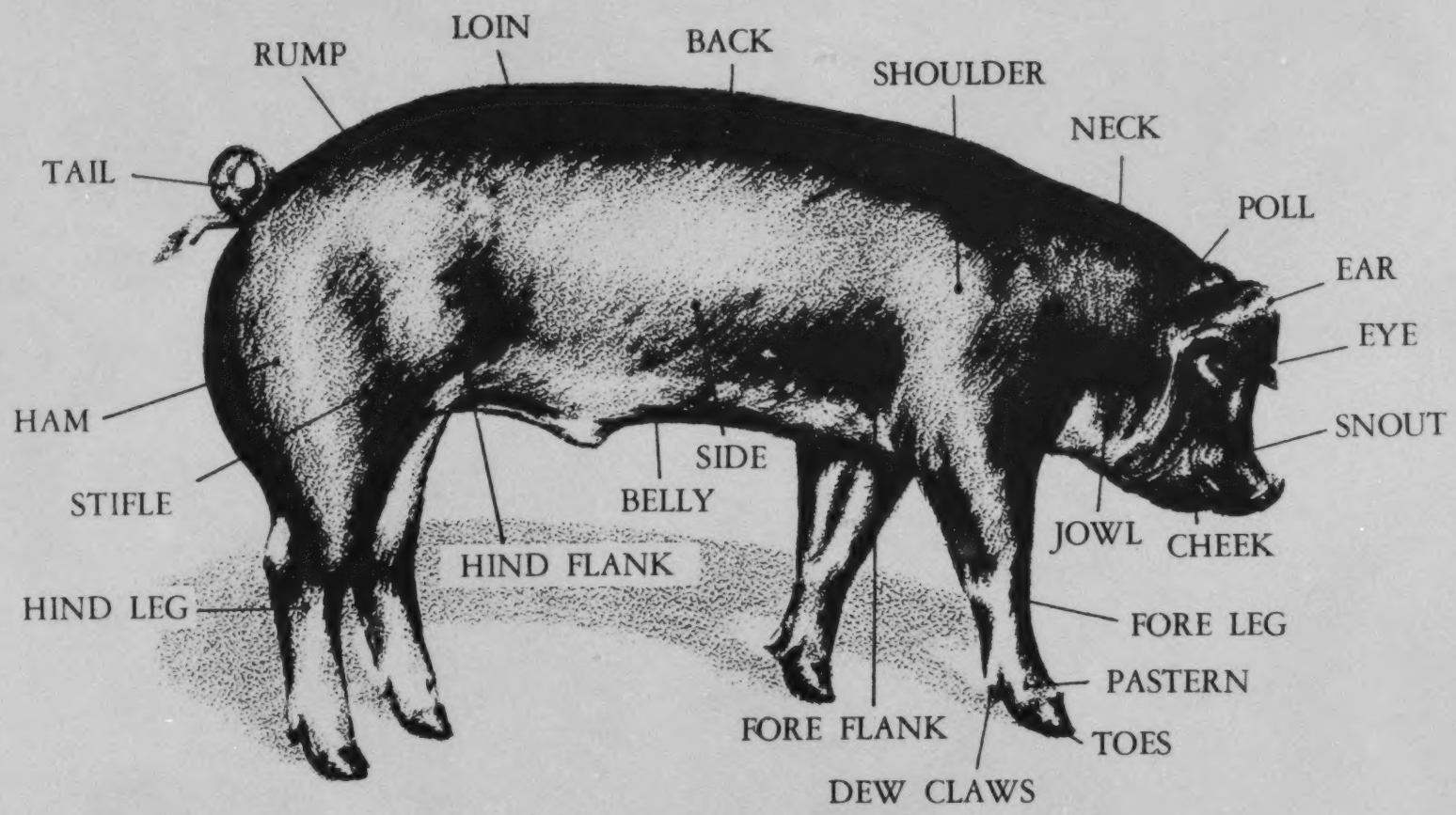
3. BACKFAT THICKNESS LESS THAN 1.5 INCHES

4. LOIN EYE 4 SQ. INCHES OR MORE

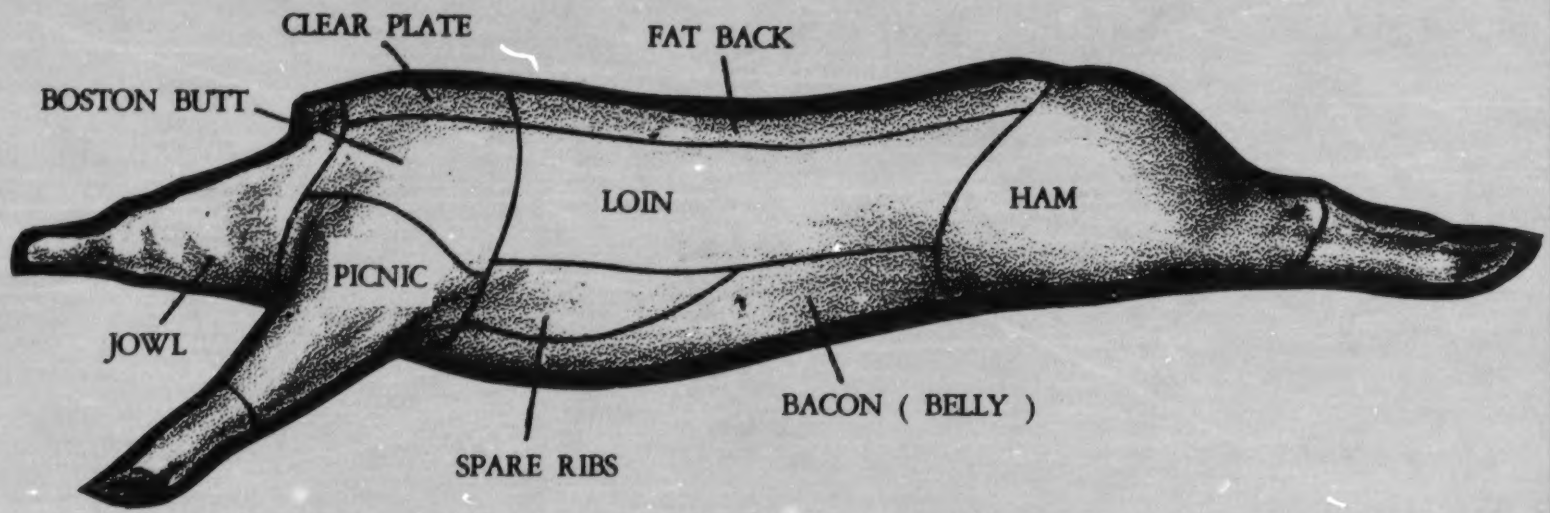
5. FEED CONVERSION OF 1 POUND GAIN TO 3.5 POUNDS OR LESS OF FEED

6. FEMALES PRODUCE AND RAISE 8 OR MORE PIGS PER LITTER

PARTS OF A HOG

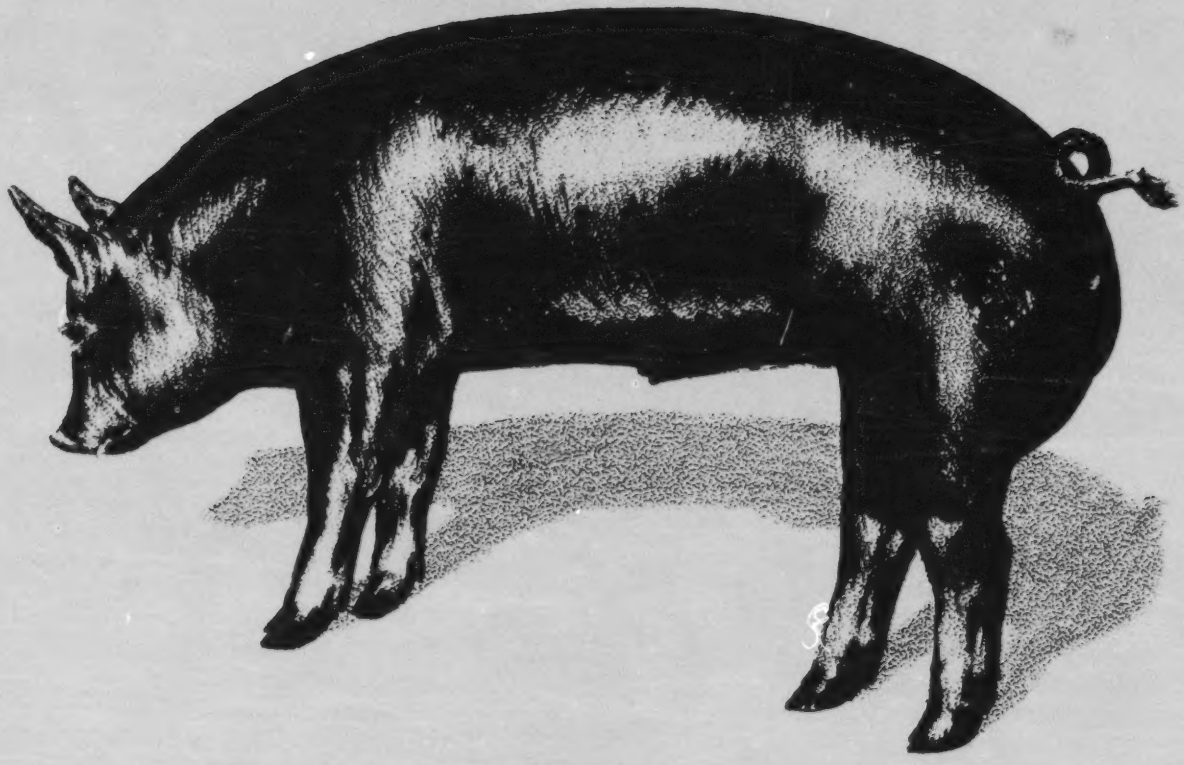


WHOLESALE CUTS OF PORK

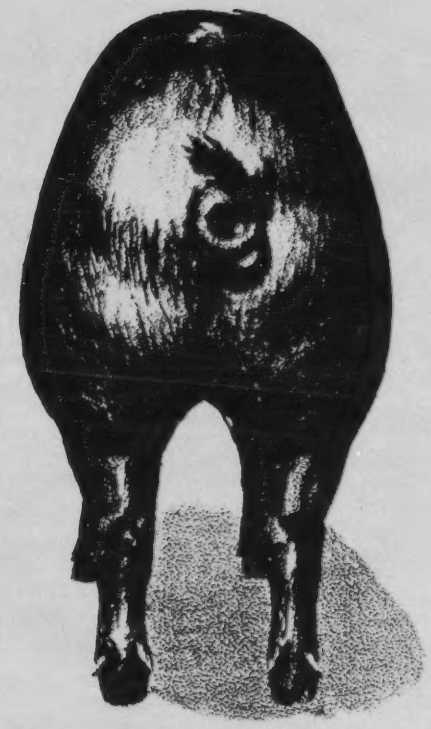


SHEEP PRODUCTION RECORD FORMS

IDEAL SWINE CONFORMATION



SIDE VIEW



REAR VIEW

SOW RECORD

SOW NO. _____

SOW'S _____ LITTER
(1, 2, etc.)

BIRTH DATE OF SOW _____

180-DAY WT. _____ 200 LB. PROBE ____ FEED/100 LB. GAIN _____

FARROWING DATE _____

TOTAL FARROWED..... MALE _____ FEMALE _____

FARROWED ALIVE..... MALE _____ FEMALE _____

TOTAL WEANED..... MALE _____ FEMALE _____

_____ DAY LITTER WT. _____
21, 35, 56, etc.

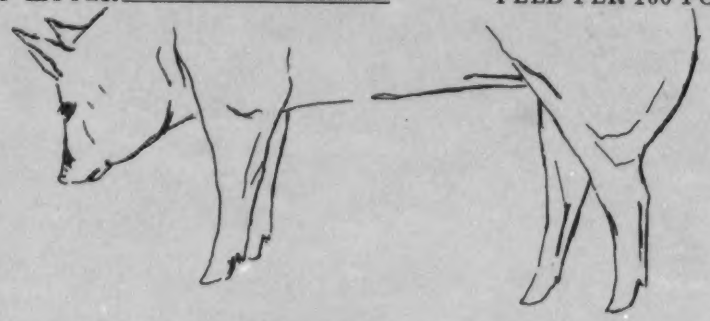
NAME _____ REG. NO. _____ BOAR NO. _____

BREED _____ BREED _____

EAR NOTCH R	EAR NOTCH L	PIG NO.	SEX	BIRTH WEIGHT	WEANING WEIGHT (OPTIONAL)	AGE WEIGHED _____ DAYS ACTUAL WT.	AGE WEIGHED _____ DAYS ADJ. 154 DAY WT.	BACKFAT PROBE SHLDR. IN.	BACKFAT PROBE BACK IN.	BACKFAT PROBE LOIN IN.	BACKFAT PROBE AV. IN.	BACKFAT PROBE ADJ. TO 200 LB.	REMARKS

AV. 154-DAY WT. OF LITTER _____

FEED PER 100 POUNDS GAIN _____



SWINE HERITABILITY ESTIMATES

TRAITS	APPROXIMATE HERITABILITY (PERCENTAGE)	
Productive traits:		
LITTER SIZE AT BIRTH	5-15	LOW
LITTER SIZE AT WEANING	5-15	
LITTER WEANING WEIGHT	10-20	
Feedlot traits:		
POST WEANING GAIN	25-35	MEDIUM
FEED PER UNIT GAIN	30-40	
Carcass traits:		
LENGTH	50-60	HIGH
BACKFAT THICKNESS	45-55	
LOIN EYE AREA	45-55	
YIELD OF LEAN CUTS	35-45	

SUMMARY OF PERFORMANCE AND CARCASS DATA OF 169 PIGS IN 1967

LITTER TESTING PROGRAM AT TEXAS A&M

	ADG	FEED EFFICIENCY	DRESS %	CARCASS DATA						
				LENGTH	BACKFAT	LOIN-EYE AREA	% LEAN CUTS			VALUE / CWT (LIVE)
							CARC.	SL. WT.	QUALITY SCORE	
AVERAGE OF 169 HOGS	1.57	332	72.3	30.1	1.31	4.72	57.3	41.5	4.36	24.64
RANGE										
MOST DESIRABLE	2.14	278	75.5	33.1	.68	6.62	67.0	47.3	8.00	26.91
LEAST DESIRABLE	1.16	439	67.3	28.1	1.83	3.49	48.8	35.5	1.00	22.53
10 HIGHEST VALUED, AV	1.68	316	73.6	30.2	1.24	5.15	59.0	43.4	5.12	25.83
10 LOWEST VALUED, AV	1.74	330	71.2	30.1	1.44	4.13	53.4	37.9	4.12	23.06

ANIMAL SCIENCE

Unit A: Breeds and Selection of Livestock and Poultry

Topic 9: Selecting Poultry

*Terms: All terms underlined are in the "Glossary of Terms."

I. Types of Poultry Producers

Several types of poultry producers, each specializing in one or more areas of production, include commercial egg producers, hatching egg producers (producing broiler chicks and egg producing chicks), broiler producers, and pullet producers.

A. The commercial egg producer generally sells his eggs to a super market, retail store, or customers on his own egg route. He strives to increase his net profit by securing maximum production while incurring a minimum of expense. The egg producer may secure replacements by raising straight-run chicks, sexed females, or by purchasing pullets from a hatchery or pullet producer.

B. The hatching egg producer, producing either hatching eggs for broiler chick or egg production chicks, produces hatching eggs from breeding stock specified by the hatchery. The hatchery designates the breed, strain, or cross that the producer will use to produce the hatching eggs; and generally, the hatchery provides the feed, tests the flock for disease, and assists the producer in making certain management decisions. The percent of hatchability and the quality of hatching eggs usually determines the price per dozen the producer receives for his eggs. In order to raise a large number of replacements and to reduce the amount of brooding equipment and housing needed, the hatching egg producer usually purchases sexed females. The hatchery disposes of the cockerels by selling them at a reduced price or by destroying them.

Transparency No. 1

Both the commercial egg and the hatching egg producer must select pullets for their laying houses or cages; therefore, they must be able to recognize profitable pullets with desirable conformation. Since conformation and production are closely related, they must have a mental image of desirable type. To develop this mental image, they should be able to use descriptive terms in describing a chicken. Learning the parts of a chicken will assist the poultryman in developing a mental image and the terminology commonly used.

Transparency No. 2

Being interested in maximum egg production, the commercial egg producer is interested in those factors pertaining to pullet selection that will affect the pullet's egg production. The following factors should be considered in selecting pullets:

1. Head—The head should show the following characteristics: strong, moderately long, and well filled in forward to the eyes to avoid any appearance of crow headedness, with the skull inclined to be somewhat flat on top rather than round. The face should be clean cut, smooth and free from wrinkles, the skin fine grain and soft in texture, the comb of good substance and size and of good color. The eye should be large, bright, and prominent; the iris should be rich in color and the pupil distinctly and perfectly formed.

2. Sexual Maturity—Sexual maturity should be expressed in the development of comb and head. Early sexual maturity should not be encouraged at the expense of growthiness and ruggedness in skeletal development. Size of development should be preferable to sexual maturity. For example, in poultry judging, a rather small, poorly developed pullet that showed advanced sexual maturity might be placed down second or third in a class of well developed pullets.

3. Body Conformation
Pullets should have an angular form and the body should be deep, broad, and well-developed. The heart girth should be of ample circumference. The back should be broad and flat with the keel of good length.

4. Plumage Condition and Skin Color—Pullets should be fully feathered with plumage of good quality. The shanks should show a good healthy color with no emphasis on intensity.

5. Feet and Toes—The pullet should be well-balanced on her legs. The feet and toes should be completely normal.

Transparency No. 3

A comparison is used to show the desirable and undesirable characteristics that might be observed in selecting pullets. Any pullet with an abnormality that would affect her egg production should not be selected.

Transparency No. 4

If the flock is a standard-bred variety, the poultryman should acquaint himself with the disqualifications of the variety listed in the American Standard of Perfection. In addition to the factors considered in selecting pullets, the poultryman producing hatching eggs should consider these factors when selecting replacements for his breeding flock:

1. Back—straight, long, and wide
2. Breast—broad, uniform fleshing
3. Legs, Thighs, and Shanks—legs and thighs well-fleshed, legs straight
4. Feet and Toes—well-formed, healthy pads on feet
5. Neck—smooth and blending with body
6. Wings—muscular, closely folded
7. Plumage, Condition, and Vigor—well-feathered, healthy, and vigorous
8. Other Defects—deformed beak, blind eye or distorted pupil, wry or crooked neck, split wing, deformed back, permanent absence of main tail feathers, crooked or malformed keel, crooked toes (90 degree angle) or deformed foot, breast blister on keel, and green shanks.

II. Culling Laying Hens

Culling, which is the opposite from selection, is the removal of inferior or undesirable birds from the laying flock. Culling should be a continuous process and the extent of culling will be determined by the health and quality of the birds, feed and labor costs, and the price of eggs per dozen.

The rate of culling has changed with the improvements in breeding and the development of high egg-producing strains of chickens. After the chickens are placed in the laying house, most poultry authorities recommend that producers cull their flocks at the ninth month of production (15 months of age); this is in addition to the continuous culling recommended to remove unthrifty and unhealthy birds as they are discovered. Hens out of production at this time will not come back into production in time to make the producer a profit. After the ninth month of production, the birds that show pigmentation and poor handling qualities should be culled as they are noticed. High egg-producing strains of chickens that go out of production before the ninth month are not being managed properly. The poultryman should correct their unsatisfactory environment, which may include improper feeding, poor sanitation, lighting, inadequate housing, or other factors.

The progressive poultryman makes a weekly analysis of production costs. Efficient egg producers are able to produce a dozen eggs on four pounds of feed or less. A simple method of figuring the egg-feed ratio is as follows:

Divide the cost per pound of feed into the price received per dozen eggs.

$$\frac{\text{Eggs per doz.}}{\text{Feed per lb.}} \quad \frac{59¢}{07¢} = 8.3 \text{ - egg-feed ratio}$$

Other expenses connected with egg production are flock depreciation, labor, and overhead (building, land, etc.). The average depreciation of birds represents approximately 10% of the cost of producing eggs; and labor and overhead represent 15 and 10%, respectively.

Transparency No. 5

In order to cull the laying flock, the poultryman must be able to recognize the characteristics of a laying hen. After he has learned to recognize these characteristics, culling is not difficult. In the culling process, he should follow a definite order of inspecting a hen. The following factors should be considered and are listed in the recommended order of inspection:

A. Head
   1. Comb
   2. Wattles
   3. Eyes
B. Body Capacity
   1. Back
   2. Abdomen
      a. Pubic bones
      b. Keel bones
C. Handling Qualities
   1. Body
   2. Abodmen
D. Condition of Vent
E. Amount of Pigment
   1. Vent
   2. Eye ring
   3. Ear lobes
   4. Beak
   5. Shanks and toes—Pigment fades in the following order in the shanks and toes:
      a. Bottom of feet
      b. Front of shank
      c. Back of shank
      d. Hock
F. Molt
   1. Order of body molt
   2. Order of wing molt

III. Evaluating Hens for Present and Past Egg Production

Transparency No. 6

With careful study and a little practice most anyone can learn to distinguish the laying hens from the non-laying hens and judge the ability of a hen to lay throughout the year based on her past production. Egg laying causes certain changes in the body of a hen that may be used as reliable guides in culling and in selection.

A. Fading of the pigment—When a pullet begins to lay, pigment fades from the various parts in this order: Vent—0 to 5 eggs, eye ring—4 to 8 eggs, ear lobes—(Leghorn only) 8 to 15 eggs, beak—25 to 45 eggs (average 35 eggs), shanks—150 to 250 eggs (average 180 eggs).

Birds will vary in rate of fading depending on the following factors:

1. Body size—small hens fade faster than heavy hens when laying at the same rate.
2. Amount of pigment—The more heavily pigmented at the start, the longer it takes to fade.
3. Health of bird—Sick or low vitality birds may fade due to disease or parasitism.
4. Feed composition—Usually does not affect rate of fading, but it does affect rate of return of pigment after laying ceases.

Pigment returns to the body parts in the same order in which it fades; only it takes about one-third the time for all pigment to return as it took for it to fade. The speed with which pigment returns is governed by:

1. Amount of pigment in the feed—The richer the feed is in pigment, the faster it will return.
2. Health and vitality of hen—The more vigorous hen returns pigment more rapidly than the low vitality hen.
3. Whether hens are confined or on range—Range birds often get more feed with pigment, so yellow color returns faster.
4. Size and coarseness of hen—More refined, smaller birds usually regain pigment at a faster rate.

The melanin or black pigments and the reddish-horn pigments of New Hampshires and Rhode Island Reds do not fade as the result of egg production. Presence of these pigments makes it more difficult to interpret the behavior of the yellow pigment.

B. Handling quality and abdominal capacity—The size and condition of the abdominal area are examined in this step. Measurements are in finger widths, such as 2 by 3, 3 by 5, etc. Other factors are: thinness and pliability of the skin, flexibility and spread of the pelvic bones, softness of the abdomen, and freeness from abdominal fat. Handling quality tells more of present production and less of past production.

C. Molt or plumage condition—Late molters are usually high producers; slow ones are poor producers. Some high producers may molt and lay at the same time, while others of equally high production may delay molt for a longer period then molt at a more rapid rate. Fast molters take 8 weeks while slow ones may require 16 to 18 weeks to finish the job. Order of molt is: Head, neck, body, primaries, main tail, secondaries. Primaries molt from axil feather (center of wing) outward from 1 to 10 in regular order. Tail feathers molt from the top downward from 1 to 7. Secondaries molt from center of wing in order: 10 to 13, 2 to 9, and 1.

Old feathers are dirty, broken, and frayed. New ones are clean and unbroken. New wing feathers or tail feathers take 6 weeks to grow to maturity, so if hen drops them in groups of 2 to 4, molt can be finished faster.

D. Constitutional vigor and vitality—Freedom from any signs of disease; is active and alert; and will stand up straight and display a high degree of vigor and vitality.

E. Head characteristics—Beak—short, strong, slightly curved; eye—bright, full, good color; eye ring—refined; skull—flat from side to side, and eye setting in front part of head, and high up near the skull; comb and wattles—large, velvety-soft, and warm.

IV. Selecting Broilers

A. Selecting broiler breeders—The poultryman should consider the same factors when selecting breeding stock for the production of broiler hatching eggs as is outlined for the selection of pullets.

Since most of the Texas broilers are grown with some type of contractual arrangement, the broiler producer selects the broilers or strain of broilers he will produce when he selects the firm with which to negotiate a contract.

The contractor generally furnishes the financing, chicks, and plays the role of riskbearer and general manager.

Transparency No. 7

B. Selecting broilers for market qualities—Official standards for quality of dressed and ready-to-cook poultry have been outlined by the Poultry Branch of the Production and Marketing Administration. Factors to be considered in determining the quality of an individual carcass are as follows:

1. Body conformation—Influenced by the relative width, length, and depth of the body. It is a major factor in determining dressing percentage and market grade. Desirable conformation includes: wide breasts, carrying the width the entire length of the keel, which is parallel with the back; broad and straight backs; bulging thighs and heavy-meated drumsticks of medium length.
2. Fleshing—Flesh is muscle tissue and has a large influence on the percentage of meat to bone and body conformation. The percent of meat on Grade A broilers is about 29% breast and 32% drumstick and thighs. For turkeys, the breast is about 31% and the drumstick and thighs 27%.
3. Finish—This has reference to fat. Fat of a light-cream or light-yellow color should be evenly distributed over the entire body. Chickens and turkeys should carry an abundance of fat but not to the extent that they have waste.
4. Pin feathers—Pin feathers are known as protruding and nonprotruding. Protruding pin feathers are those that are out from under the skin and the feather has not matured but may be partially formed. An "A" quality ready-to-cook broiler or turkey must be free of all protruding pins. Nonprotruding pin feathers are those that have not grown enough to come through the skin. An "A" quality ready-to-cook broiler or turkey must be practically free of these pins on the legs and all parts of the body.

5. Defects—One or more defects can reduce the market grade and in most cases are serious enough to cause poultry to be sifted at the show.

Some common defects are:

Curved breastbone	Crooked back
Crooked breastbone	Callouses
Hunch back	Blisters
Torn skin	External parasite blemishes
Dented breastbone	

Requirements for "A" quality broilers and turkeys do not permit cuts or tears on breasts or legs and only a limited amount for "B" quality. Crooked toes are generally considered a defect which lowers the grade.

6. Bruises or skin discolorations—Bruises can be either skin or flesh. They always occur while the chicken is alive—never after it is bled. The flesh bruise is most serious with respect to grade.
Skin discolorations may be caused from flesh or skin bruises, hard scalding, external parasites, and/or rough handling.

7. Disjointed bones, broken bones, and/or missing parts—Grade "A" quality permits no broken bones, one disjointed bone, and only wing tip(s) and/or tail missing.

C. Selecting Turkeys—The contractual arrangement with turkey producers is very similar to that of the broiler producer; however, there are more independent turkey producers (producers raising turkeys without a contract).

The same factors that are considered when buying chicks should be considered when buying broiler turkeys or turkeys for the breeding flock.

Transparency No. 8

The prospective turkey producer should know the parts of a turkey so that he can describe a turkey and converse with others when discussing the selection of turkeys. Common terminology should be used.

Transparency No. 9

Turkey broiler producers and chicken broiler producers are breeding for similar conformation. The same standards that were discussed for grading dressed and ready-to-cook broilers would apply to market turkeys also.

REFERENCES:

1. American Poultry Association, Inc., The American Standard of Perfection, The American Poultry Association, Davenport, IA.

2. Bundy, Clarence E. and Ronald V. Diggins, Poultry Production, Prentice-Hall, Inc., Englewood Cliffs, NJ.

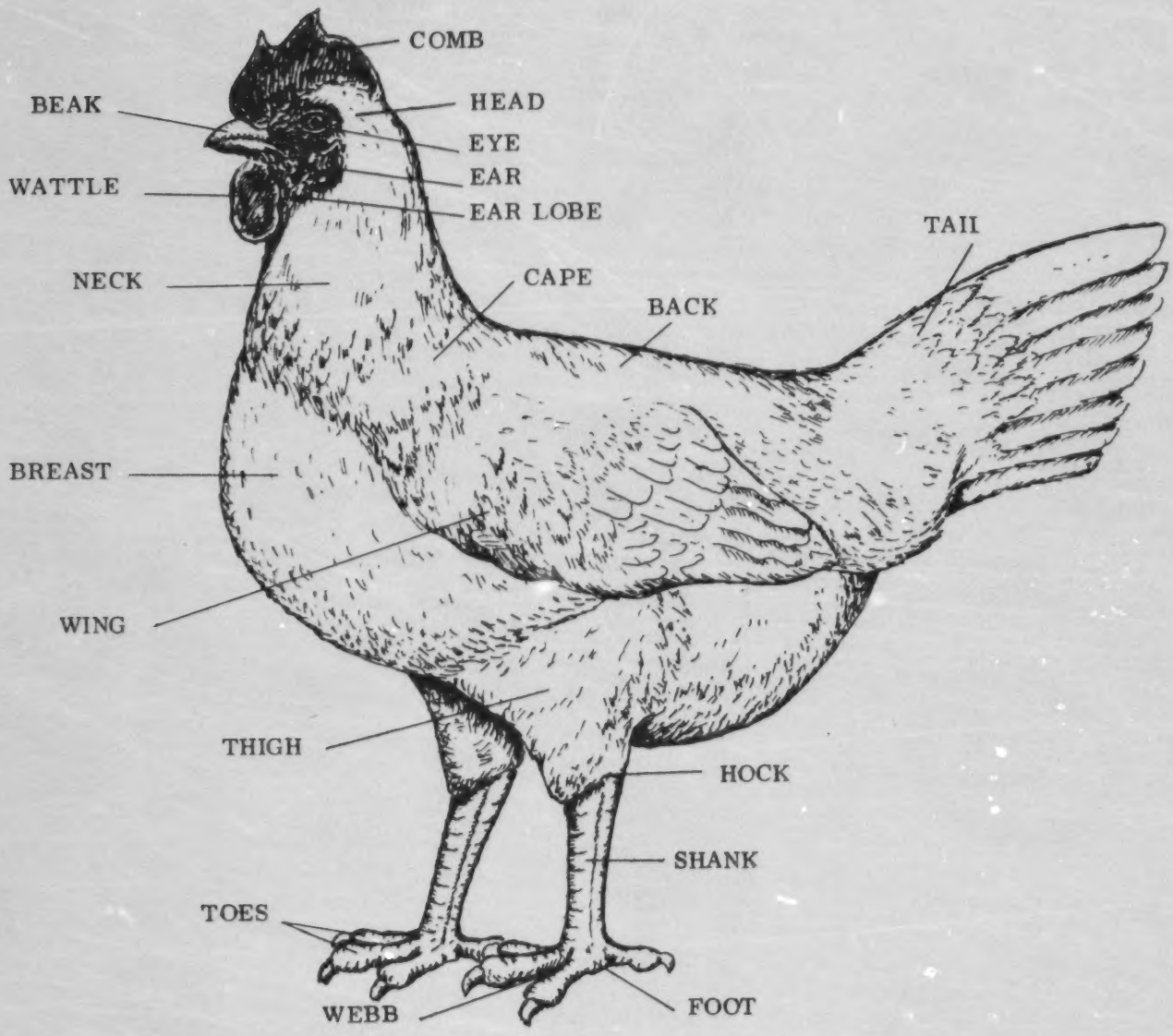
3. Parnell, E. D., Poultry Production, John Wiley and Sons, Inc., New York, NY.

4. Clark, O. V. and J. F. Scoggin, A Reference on Egg Production, State Board for Vocational Education in cooperation with Agricultural Education Department, Subject Matter Service, Mississippi State University, Jackson, MS, 1960.

5. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.

6. "Poultry Judging Handbook," Texas Agricultural Extension Service, Texas A&M University, College Station, TX, 1964.

PARTS OF A CHICKEN



FACTORS TO CONSIDER IN SELECTING PULLETS

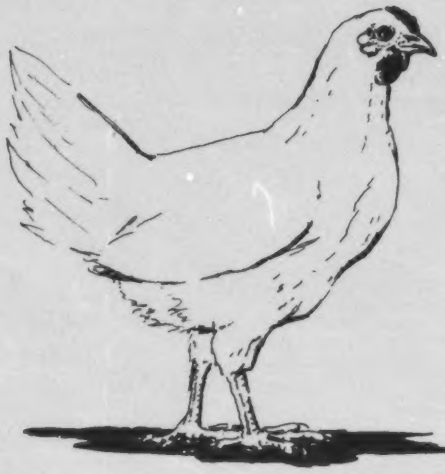
1. HEAD — STRONG, MODERATELY LONG, & WELL FILLED IN FORWARD TO THE EYES; THE COMB OF GOOD SIZE & SUBSTANCE & RICH IN COLOR; THE EYE SHOULD BE LARGE , BRIGHT, & PROMINENT.

2. SEXUAL MATURITY — WELL DEVELOPED COMB & HEAD; GROWTHINESS & RUGGEDNESS IN SKELETAL DEVELOPMENT AT EARLY AGE IS DESIRABLE.

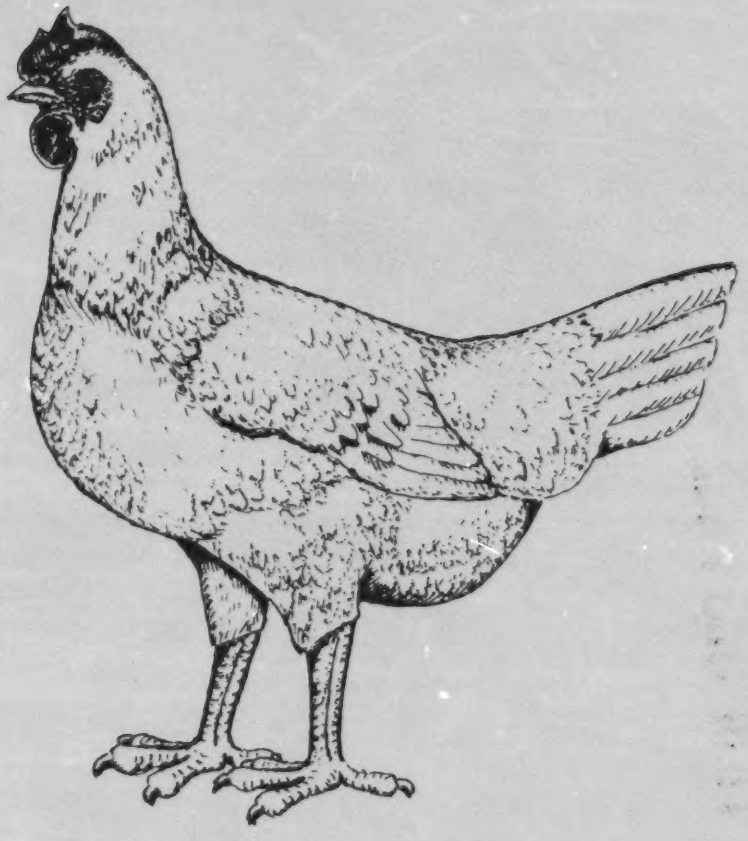
3. BODY CONFORMATION — DEEP, BROAD, & WELL DEVELOPED WITH A LONG KEEL.

4. PLUMAGE CONDITION & SKIN COLOR — WITH GOOD QUALITY PLUMAGE & SHANKS SHOWING A RICH HEALTHY COLOR.

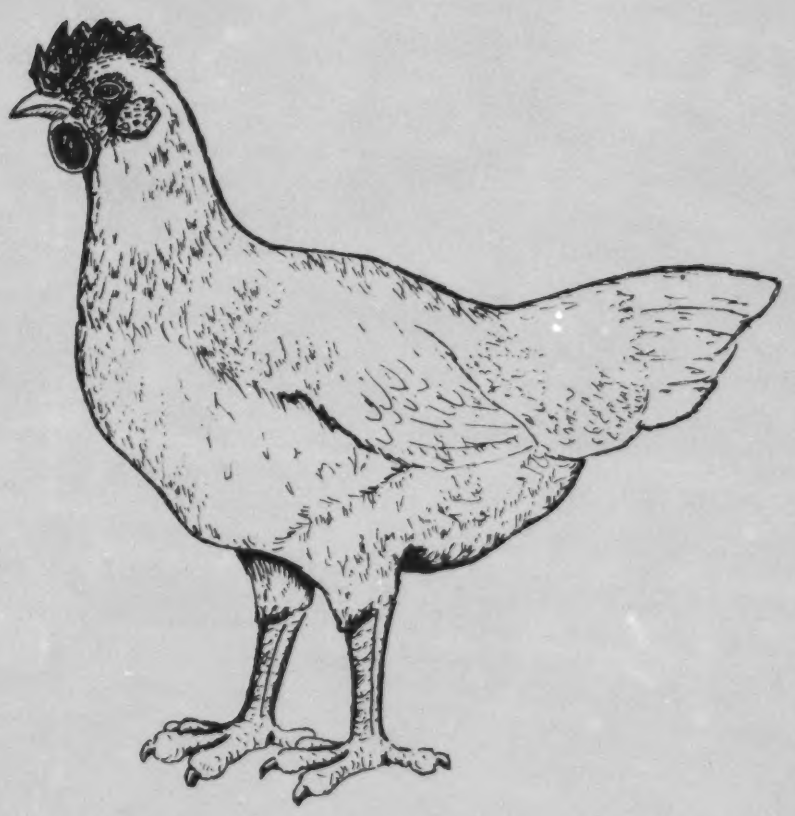
5. FEET & TOES — NORMAL DEVELOPMENT & WELL BALANCED ON LEGS.



PULLET CONFORMATION



DESIRABLE

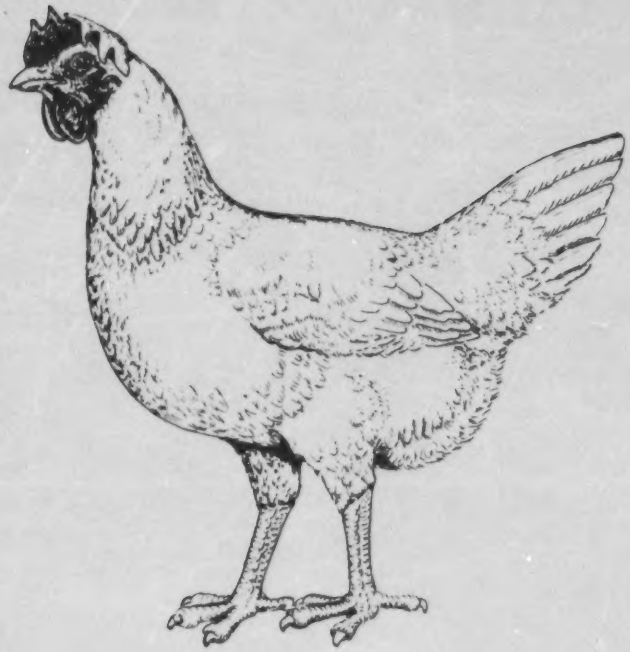


UNDESIRABLE

FACTORS TO CONSIDER IN SELECTING FLOCK REPLACEMENTS

1. BACK - STRAIGHT, LONG, AND WIDE
2. BREAST - BROAD, UNIFORM FLESHING
3. LEGS, THIGHS, AND SHANKS - LEGS AND THIGHS WELL FLESHED; LEGS STRAIGHT
4. FEET AND TOES - WELL FORMED, HEALTHY PADS ON FEET
5. NECK - SMOOTH AND BLENDING WITH BODY
6. WINGS - MUSCULAR, CLOSELY FOLDED
7. PLUMAGE, CONDITION, AND VIGOR - WELL FEATHERED, HEALTHY, AND VIGOROUS
8. OTHER DEFECTS - DEFORMED BEAK, BLIND EYE OR DISTORTED PUPIL, WRY OR CROOKED NECK, SPLIT WING, DEFORMED BACK, PERMANENT ABSENCE OF MAIN TAIL FEATHERS, CROOKED OR MALFORMED KEEL, CROOKED TOES (90% DEGREE ANGLE) OR DEFORMED FOOT, BREAST BLISTER ON KEEL, AND GREEN SHANKS.

LAYER CONFORMATION



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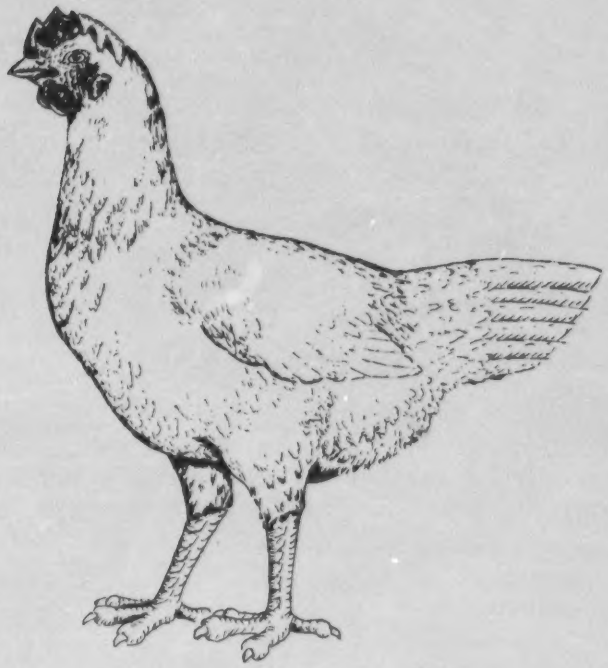

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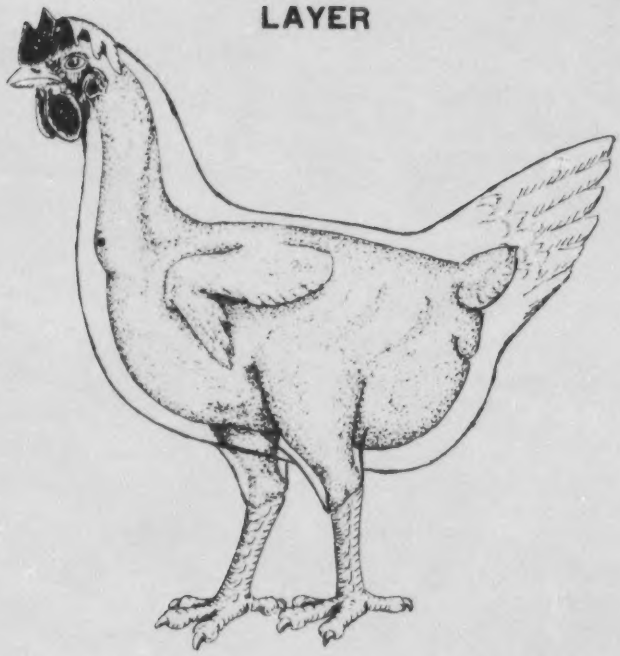


EVALUATING HENS FOR RATE OF EGG PRODUCTION PAST AND PRESENT

1. PIGMENTATION — FADES AND RETURNS IN ORDER OF VENT, EYE RING , AND EAR LOBE (MEDITERRANEAN CLASS ONLY). ALSO BEAK, SHANKS, FEET, AND TOES.

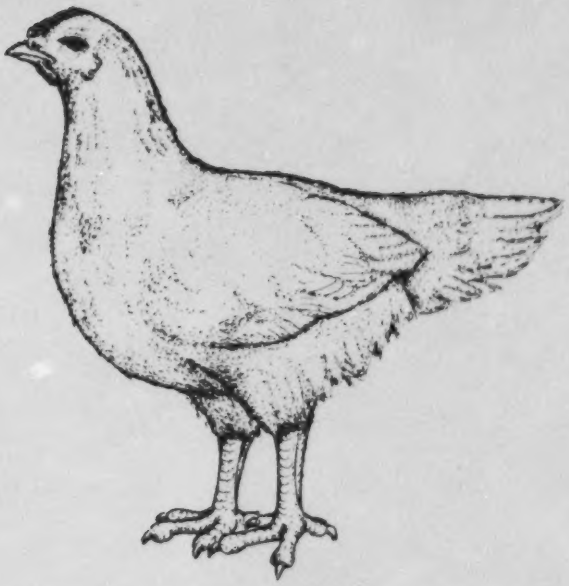
2. HANDLING QUALITIES – WIDTH, DEPTH, AND PLIABLENESS OF ABDOMINAL SECTION; FLEXIBILITY AND SPREAD OF PELVIC BONES; AND ENLARGEMENT AND MOISTNESS OF VENT .

3. PLUMAGE CONDITION — PRESENCE OF MOLT CONDITION; ORDER OF MOLT - HEAD, NECK, BODY, WING, AND TAIL; FRAYED, WORN, OR SOILED PLUMAGE.

4. CONSTITUTIONAL VIGOR & VITALITY — FREEDOM FROM DISEASE, ACTIVE AND ALERT, STANDS ERECT AND DISPLAYS A HIGH DEGREE OF VIGOR AND VITALITY.

5. HEAD CHARACTERISTICS BROAD, DEEP, AND REFINED; COMB AND WATTLES - LARGE, PROMINENT, AND WAXY RED;EYES - BRIGHT AND ALERT

BROILER CONFORMATION



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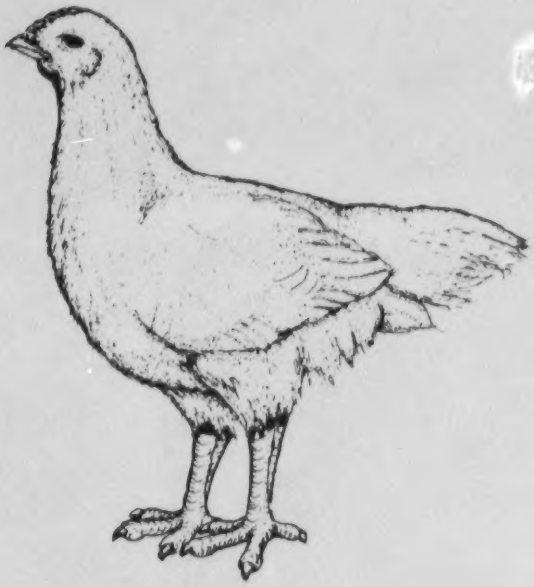

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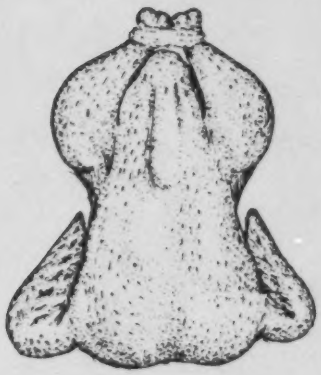
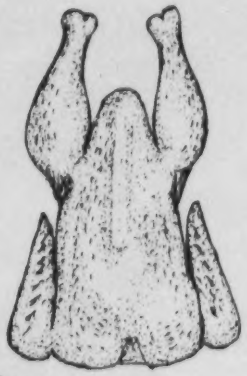
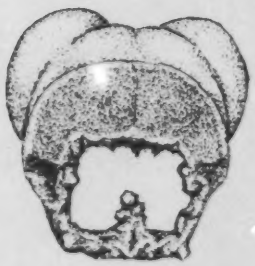
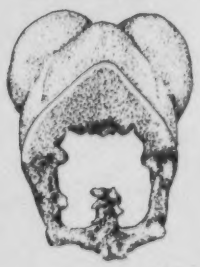




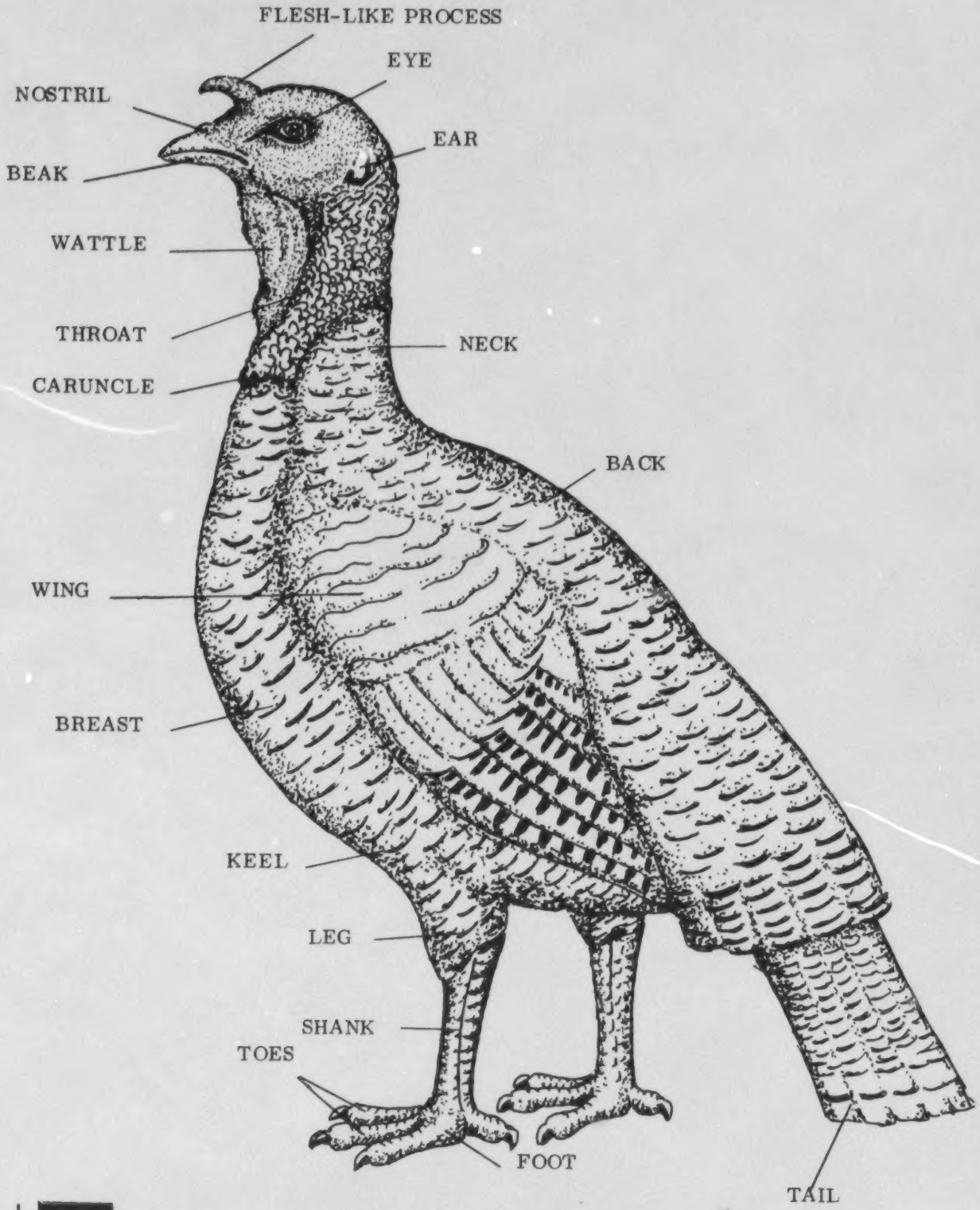
DRESSED CARCASS



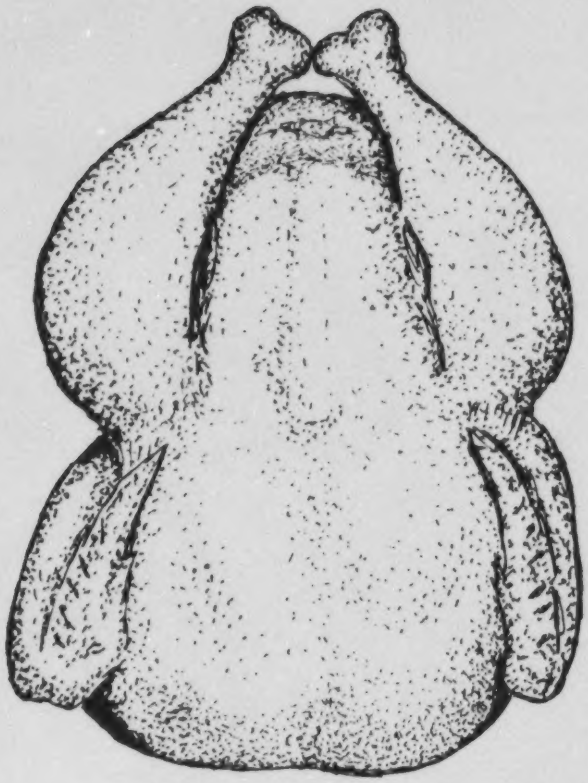


CROSS SECTION OF BREAST

PARTS OF A TURKEY



TURKEY CONFORMATION



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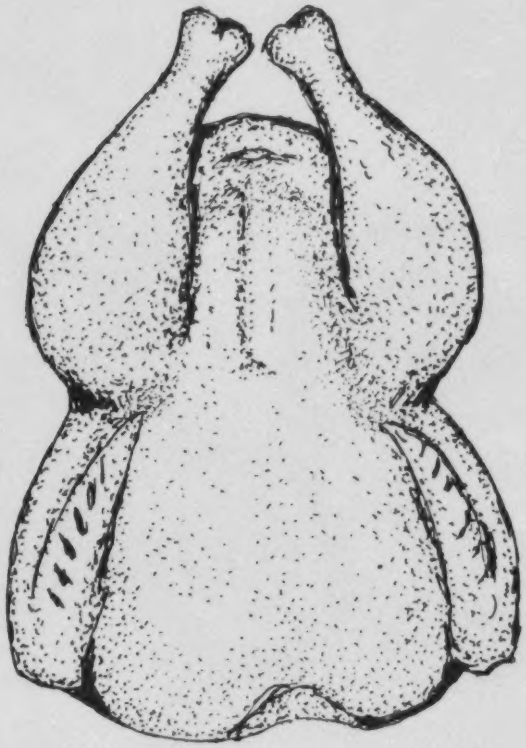

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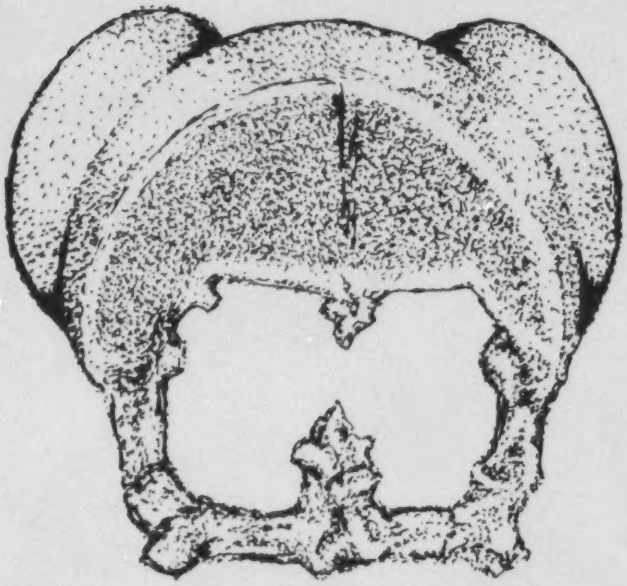
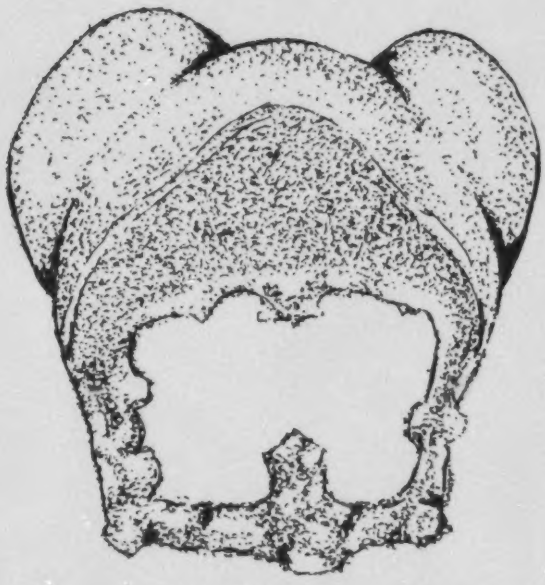




CROSS SECTION OF BREAST

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 1: Handling and Restraint of Animals

I. Haltering Livestock

The two classes of livestock that are usually haltered and trained to lead are cattle and horses. When training animals in either class to lead, the best time to train them is while they are young (three to four months of age).

There are several different kinds of halters and hackamores, usually made from rope, that may be used to train cattle and horses to lead.

A. Haltering the Calf

At the beginning of the training period, the calf should be haltered and tied for short intervals. Approximately two feet of rope should be allowed between the calf and the tie, which should be at the same level as the calf's head; and the calf should be tied to something substantial. Show calves are sometimes trained by leading them to and from their nurse cow or mothers. After the calf has been led short distances, it should be taken for longer walks. Assistance may be needed if the calf balks. Pulling the calf to one side and then to the other sometimes causes it to resume walking. Another method used to get a calf to walk is to make a large, non-slipping loop and place the loop over the calf's back and above his hocks. Applying the same amount of pressure to the non-slipping loop rope as is applied to the lead rope may cause the calf to walk.

B. Haltering the Colt

Six to eight half-hour lessons, depending upon a colt's disposition, are usually required to train a colt to lead; older horses will require more time. Training colts to lead while young makes them easier to handle, causes less injuries, and makes better working horses out of them.

When the trainer begins to train the young colt to lead, he should pen the colt to itself and away from other horses so that he can retain its attention. Using the mare, the trainer should crowd the colt into a corner to catch it. The colt should be approached as quietly as possible; the trainer should catch the colt by placing one arm around the front and under its neck; the other arm should be placed around the rear legs of the colt and below its tail head. The trainer may need to secure assistance the first few times the colt is caught to prevent injury to it. After the colt is caught, the trainer should pet and brush it to relieve its fears. To prevent injury to the colt, the trainer should tie the colt above the level of its head. Some trainers use an innertube which has been tied to something substantial to train the colt to stand. The innertube expands and con-

tracts as the colt applies and releases pressure on the halter rope. Since the care of horses' feet is important, the trainer should include the picking up of the colt's feet as a part of its training. Great patience and carefulness are required to train the colt properly. One should never attempt to handle a young horse until he is sure he can control his own temper and keep absolutely calm and quiet while handling it. When training the colt to lead, the trainer may have to pull the colt gently from one side then to the other side to get the colt to walk. As was mentioned in the paragraph on training a calf to lead, the trainer, after the colt has had two or three leading lessons and has been gentled some, may use a nonslip loop to make the colt walk. The nonslip loop is slipped over the colt's hindquarters.

II. Restraint of Animals

Since it is necessary to apply restraint to most animals at times, several methods of restraint that can be used on different classes of animals will be discussed.

A. Restraint of Cattle

Cattle must often be restrained in order to brand, dehorn, mark, castrate, fit for show, and for other reasons. The cattleman should use the most practical means of restraint when preparing to perform one of the above operations. Some of the factors that he must consider to determine the method of restraint to use are the age of the animal, kinds of equipment available, availability of labor, time needed to perform the operation, and personal preference.

Transparency No. 1

The tail restraint, nose lead, and the grasping of the nostrils with the hand are methods of restraint that divert the animal's attention from an area of pain to the pain caused by the restraint. It may be necessary to apply more than one method of restraint to control an animal.

1. Tail restraint may be used to divert the cow's attention by grasping the tail near its base and by applying pressure in an upward and forward manner as shown. The person applying tail restraint should stand to one side of the animal to avoid being kicked. Tail restraint may be used when giving udder injections or other treatments to a nervous cow.

2. The use of a nose lead is one of the easiest ways to restrain a cow. It permits the user to perform several jobs such as giving injections, for examining specific areas of the body or feet, and for performing numerous management practices.

3. Grasping the nostrils firmly with the thumb and forefinger may be sufficient for restraining some cattle in the absence of a nose lead depending on the temperament and size of the animal.

Transparency No. 2

To keep a cow from kicking, the handler may use the following methods of restraint:

1. Hobbles—Milking hobbles as shown here are a restraint often used by dairy farmers at milking time. The two metal clasps fit over the hind legs just above the hock. The chain may be adjusted to draw the legs closer together for more security.
2. Squeeze restraint—Another method of restraint to keep a cow from kicking. A rope loop is formed around the cow's body in front of the udder as shown. When the rope end is pulled tight, it squeezes the cow and generally will cause her to stand still (assuming that her head is secured).
3. Front leg hobble—A rope with an eye in one end is looped around the pastern and the loose end is passed over the cows withers where it can be held by someone from the opposite side. In this way a front leg can be raised and held off the ground for examination or treatment.
4. Beam hook method—In applying this method to raise the rear leg, the cow's head should be pulled to the side opposite the rear leg which is to be examined. Then a piece of rope with an eye is looped around the cow's leg below the fetlock and the free end is passed upward through a ring or hook that is fastened to a beam above and somewhat behind the cow. After the rope is passed through the hook, the end is brought down around the same leg above the hock and a half hitch is formed. The rope end is then carried forward and wrapped around the stanchion or some other object to secure it. As the cow's foot is lifted off the ground the slack may be taken up.
5. Trimming rack—This rack may be used for several purposes but it is basically designed for hoof trimming. The band or sling attached to a beam on each side supports the animal's weight, thus permitting the feet to be raised and secured to the timber or support at the side.

Transparency No. 3

The method of restraint used will be determined generally by the operation to be performed.

1. Burley method of casting and restraint—With the cow's head secured, a 40 foot piece of rope is placed over her back with the center at the withers. The ends are then passed under the fore legs and crossed with an end then being carried up each side of the cow's body and the two are crossed again over the back. Each rope end then passes downward between the rear legs. When the ends of the rope are pulled the animal will fall. The operator can control the direction of fall by pulling the casting ropes to force the animal to one side or the other. The rear legs can then be secured by placing a half hitch around the fetlock and then passing the free end over the hock, across the cannon bone, and back around the fetlock.
2. Rope method of casting—A loop is first placed around the animal's horns or neck and then two half hitches are made around the animal's body behind the shoulder and in front of the hip bone. When the rope is pulled and enough pressure is applied, the animal will fall and then can be secured by keeping pressure on the rope and by tying the feet.

3. Dehorning restraint—This method of restraint may be used to hold a cow's neck securely to a post or other other object while dehorning.

B. Restraint of Swine

Transparency No. 4

Since swine cannot endure rough handling, especially in hot weather, and because of the thin, easily broken bones in their legs, the methods used to restrain hogs are very important. A good set of pens and portable panels are necessary to properly handle hogs. Some of the methods for restraining swine are shown here.

1. Commercial hog holder—One of the most effective methods of restraining hogs is the use of a snare or wire cable which is passed around the hog's snout. It should be placed around the upper jaw behind the tusks and then held securely.
2. Nose holder—A piece of rope looped around the upper jaw of the snout in the same manner as above may also be used to secure the hog.
3. Pig restraining trough—A "V" shaped trough as shown may be useful for holding and securing pigs.
4. Another effective method of restraining pigs for castration or vaccination when suitable equipment is not available is shown. With the animal on its back, the holder is kneeling or sitting across the front section of the animal's body and is holding the hind legs securely in each hand. This makes it very easy for the operator to perform his tasks.

C. Restraint of Sheep

Transparency No. 5

Most sheep are raised in large flocks, and sheep are restrained in order to be sheared, drenched, dipped, docked, castrated, and vaccinated. One of the most important factors to remember in handling sheep is not to catch and hold them by their wool; handling them in this manner bruises the skin.

1. Catching and holding sheep—The preferred way to catch a sheep by hand is to place an arm under the jaw and around the neck.

   When holding a sheep, stand on the animal's left side, placing the left hand under the jaw and the right arm around behind his thighs. The left arm will prevent the animal from moving forward while the right arm will stop backward movement.

   Don't attempt to hold a sheep by pulling on his head, horns, or wool.

2. Fleece inspection—The handler should press the sheep's head and neck against his left leg with his left arm. By holding the sheep in this manner, the handler is able to examine the wool on the animal's shoulder and side. The condition and density of the wool can be examined by laying the hands flat on the surface of the fleece and gently forcing it to part. The best wool grows on the side of the shoulder where this part is being made. The holder may need assistance in holding the sheep while he examines the belly and britch wool.

3. Docking and castrating—Restraint to perform these two operations may be administered by holding the front and rear leg on either side in each hand while supporting the back against the body (if standing) or between the legs (when seated).

The sheep is held in the standing position for drenching. The handler usually stands astraddle the sheep and holds it by applying pressure with his legs against the sheep's body; he places his left hand under the sheep's chin to hold its head. The handler's right hand is used to drench the sheep.

The methods used to restrain goats are the same as those for sheep; however, many goats have horns which make them much easier to catch and hold.

D. Restraint of Horses

Because of their size, strength, and the ability of horses to inflict fatal injuries, the trainer must be able to restrain them. Horses are quick to detect nervousness or a lack of self-confidence on the part of the trainer, so the trainer must have a direct and confident approach. Horses are appreciative of kindness, and a piece of sugar or a little feed will move a horse quicker than a threat.

When determining the type of restraint to use, the trainer should consider the horse's temperament, and no more restraint should be used than is necessary to control the horse.

Transparency No. 6

Breeding hobbles are used to prevent the mare from kicking the stallion during breeding and to allow the veterinarian to examine or operate on the rectum or vagina. A harness such as you see here may be used or ropes may be used to form the restraining hobbles.

Twitches are one of the oldest methods used to restrain horses. The pain produced by applying pressure on the sensory nerves of the horse's lips diverts his attention from the operation or treatment to the pain produced by the twitch. The twitch may be the ideal type of restraint to use on some horses, while its application on other horses may cause them to become less tractable.

The principle of the yankee war bridle is the same as that of the twitch. Pressure on the rope causes pain, thus diverting the horse's attention.

The side stick is used to prevent the horse from reaching the posterior half of his body with his mouth; however, it allows the horse freedom of movement and does not prohibit him from eating at ground level.

The cradle is used to prevent the horse from turning his neck and prevents him from reaching his body or legs. Either the cradle must be removed or the feed raised to the height of the horse's mouth in order for the horse to eat.

The tail tie is useful as a restraint because most of a horse's weight can be supported by his tail; the tail is very useful in lifting hind legs of horses.

A newborn foal should not be restrained by catching hold of its body parts but should be held in the manner recommended in the transparency.

III. Driving, Herding, Loading, and Hauling Livestock

Many of the animals reaching our livestock market today are bruised; in fact, research indicates that one out of every ten hogs marketed is bruised. The average loss per injured hog is $5.00. One out of each fifteen head of cattle marketed is bruised; and in addition to the reduction of the value of the meat that is left, there is a loss of $10-12 in the value of the carcass. These losses can be greatly reduced by the following means:

A. Use canvas slappers instead of sticks, whips, canes, or clubs.
B. Eliminate loading hazards such as protruding nails, equipment in pens, and broken boards.
C. Maintain adequate loading facilities: docks, alleys, and chutes.
D. Bed trucks properly. In summer, bed truck with sand; the sand should be wet when hauling hogs. In winter, the truck should be bedded with straw when hauling sheep or hogs, and it should be bedded with sand when hauling cattle.
E. Load carefully. When loading livestock, the trucker should handle the animals slowly and easily. If possible, the animals should be given time to acquaint themselves with pens and chutes before the trucks arrive. According to research, animals prefer to walk up steps.

   Partitions should be used to separate loaded animals and to prevent fighting and trampling. Partitions should also be used to segregate the different classes of animals, and they may be used to assist the trucker in loading the correct number of animals in a given area. Too few animals loaded in a given area cause them to be tossed around, and too many animals for a given area cause excessive shrinkage, bruises, and possibly death.

F. The Driver—A good driver will avoid sudden stops and be considerate to the animals he is hauling. Fast starts and stops cause injury to animals.

IV. Determining the Number of Animals to Load

The factors listed below will assist the stockman in determining the number of animals to load on a given truck:

A. Amount of fill
B. Size, sex, and age of animals
C. Distance to market
D. Weather conditions
E. Conditions of vehicle

Transparency No. 7

The recommendations for the number of animals to load in a truck were secured from the Livestock Conservation, Inc., Union Stock Yards, Chicago, Illinois.

REFERENCES:

1. Leahy, John R. and Pat Barrow, Restraint of Animals, Second Edition, Cornell Campus Store, Inc., Ithaca, NY, 1953.

2. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.

LIVESTOCK RESTRAINTS

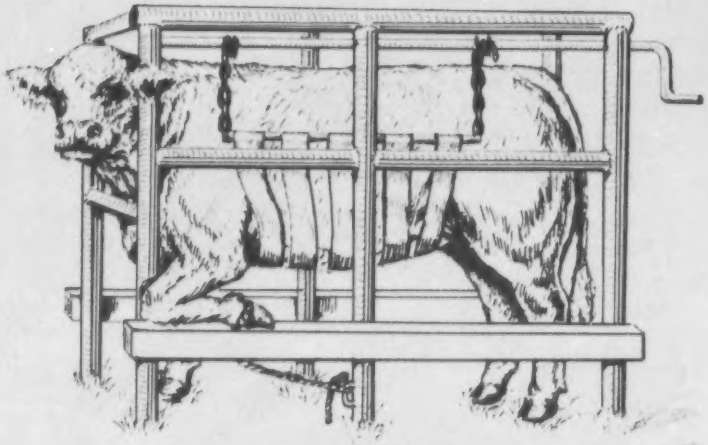
TAIL RESTRAINT

NOSE LEADS

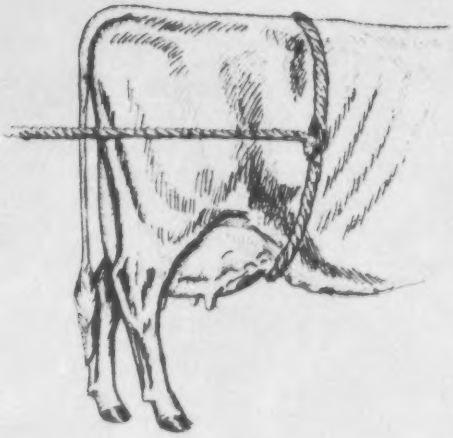
GRASPING THE NOSTRILS

RESTRAINTS THAT PREVENT KICKING

HOBBLES

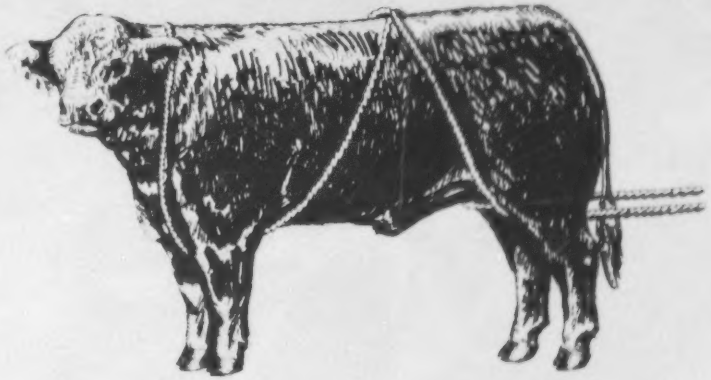


TRIMMING STOCK

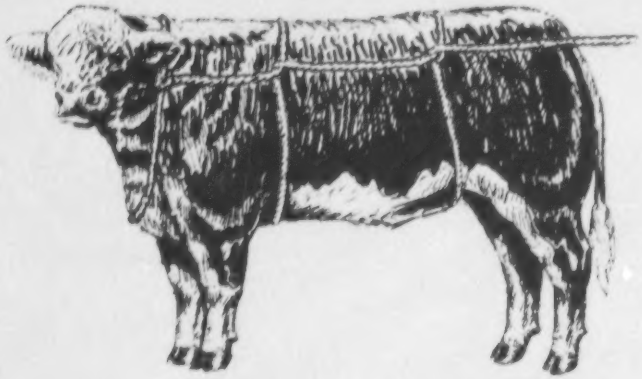


SQUEEZE RESTRAINT

CASTING AND RESTRAINING METHODS



BURLEY METHOD OF CASTING AND RESTRAINT



ROPE METHOD OF CASTING

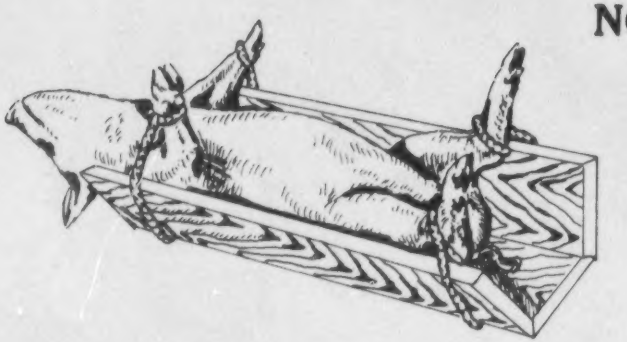
DEHORNING RESTRAINT

METHODS OF RESTRAINING SWINE

HAND RESTRAINT

COMMERCIAL HOG HOLDER

NOOSE



PIG RESTRAINING TROUBLE

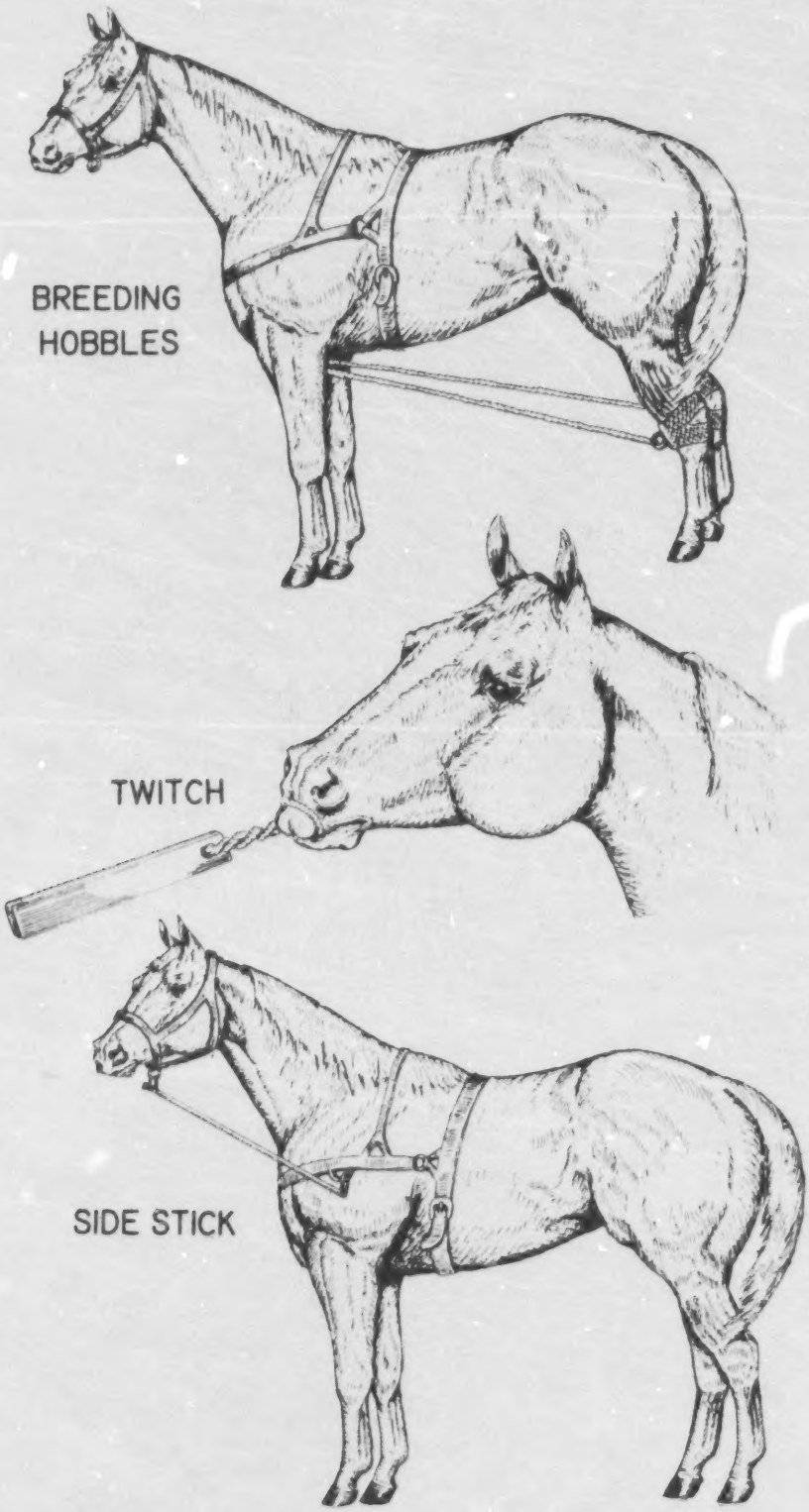
RESTRAINING SHEEP

HOLDING

FLEECE INSPECTION

DOCKING AND CASTRATING

RESTRAINTS OF HORSES



NUMBER OF CATTLE FOR SAFE LOADING IN A TRUCK

FLOOR LENGTH	AVERAGE WEIGHT OF CATTLE, LBS.					
	450	600	800	1000	1200	1400
(FT.)	(NO.)	(NO.)	(NO.)	(NO.)	(NO.)	(NO.)
8	8	7	5	4	4	3
12	13	10	8	7	6	5
18	20	16	13	11	9	8
24	27	22	17	15	13	11
30	34	27	22	19	16	14
42	48	39	31	28	22	20

NUMBER OF SHEEP PER DECK FOR SAFE LOADING IN A TRUCK

FLOOR LENGTH	AVERAGE WEIGHT OF SHEEP, LBS.			
	60	80	100	120
(FT.)	(NO.)	(NO.)	(NO.)	(NO.)
8	28	23	20	18
12	43	35	31	28
18	65	54	48	43
24	88	73	65	58
30	110	92	81	73
36	133	110	98	88

NUMBER OF HOGS & CALVES FOR SINGLE-DECK TRUCKS FOR SAFE LOADING

FLOOR LENGTH	AVERAGE WEIGHT OF ANIMALS, LBS.		
	150	200	300
(FT.)	(NO.)	(NO.)	(NO.)
8	21	18	13
15	39	33	24
24	62	52	38
30	77	66	47

NUMBER OF HOGS & CALVES FOR DOUBLE-DECK TRUCKS FOR SAFE LOADING (DIVIDE EQUALLY BETWEEN DECKS)

FLOOR LENGTH	AVERAGE WEIGHT OF ANIMALS, LBS.			
	150	200	250	350
(FT.)	(NO.)	(NO.)	(NO.)	(NO.)
10	41	36	30	23
15	62	54	45	34
20	83	72	61	46
28	116	101	86	64
32	133	115	97	73

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 2: Castrating Livestock

*Terms: All terms underlined are in the "Glossary of Terms."

I. Castration as a Management Practice

Castration, or the removal of the testicles from the scrotum of the male is a common management practice often used by livestock breeders.

First, let's consider the function of these male reproductive organs. The testicles of male animals have two functions: the production of male germ cells and the production of male sex hormones. Testosterone, which is the male sex hormone, stimulates the development of the male reproductive organs, the growth processes, and affects the anatomy of certain parts of the male animal. One has noticed, undoubtedly, that male animals have heavier crests and necks, are heavier in the forequarters, and have more overall muscling than females or castrated animals.

Then, consider the effects of castrating the male and the reasons for performing this operation. The removal of the testicles eliminates the supply of testosterone which in effect alters the physical development of the male and supresses its sexual desires and behavior. This change in the physical development may improve the meat qualities of animals used for food consumption. Also, the behavior or temperament of the male may be changed to increase its suitability for handling and/or other purposes. More specific uses will be discussed in the information to follow.

A. Castration of Cattle

The early cattle producer had justification for castrating. He was unable to control large groups of mixed cattle because of a lack of fences and equipment, and the consumer demanded overfat beef. These conditions no longer exist.

Recent research conducted in several states and foreign countries proves the superiority of male beef animals in the production of beef. According to this research, male beef animals gain much faster than steers (up to one-half pound per day in some cases), weigh 5 to 10 percent more at weaning, produce leaner, more muscular meat, and produce meat that is acceptable to the consumer. Animals in the experiments were slaughtered at eighteen months of age or less. In preference tests, the consumer purchased lean meat whether it came from a bull, heifer, or steer carcass.

Even though there are weight gain advantages in feeding bulls and the quality of meat of the male beef animals is comparable to females and steers, the producer selling bulls on the market may receive less money per pound. However, he might make a greater net profit by feeding bulls because of faster gains and a shorter feeding period.

The two main reasons for discounting male beef animals were the U.S.D.A. grading standard requirement that the word "bull" be stamped on all known bull carcasses and the packers' hesitancy to accept male beef animals on their merits. Also, it is known that consumers are prejudiced against bull meat. However, under the new U.S.D.A. standards that went into effect January 1, 1973, beef from young bulls (to be identified as "bullocks") will be federally graded on the same standards as beef from steers. The revision in standards also included discontinuance of the quality grades for beef from older bulls since they are now being used almost exclusively in processed meat products.

Although the livestock producer may continue to castrate some animals, chances are he will do less of it in the future.

Castration should generally be done when the calves are between one and three months of age.

Also in areas where the screw worm is a problem, it is best to castrate calves in the early spring or late fall to avoid infestation from flies. A good practice to follow when castration is done during the fly season is to apply a repellant to the wound.

The castrated bull calf is known as a steer.

Many FFA members and others who feed steers for the stock shows have recognized the superior muscle development of male animals. Because of this, some feeders fitting steers for show castrate as late as possible.

B. Castration of Swine

It is a common practice to castrate all male pigs that are not to be used for breeding purposes. They should be castrated at an early age while they are still nursing the sow. Pigs should be castrated far enough in advance of weaning to allow healing which usually takes 2 to 3 weeks. Generally this means that castration should be done within the first 4 weeks. Castration should not be done at the same time that the pigs are vaccinated.

If a male hog is allowed to reach sexual maturity (6 to 8 months of age), the cooked meat of this animal's carcass has an unpleasant odor and taste. For this reason, the producer needs to continue to castrate male pigs in order to produce quality pork.

The castrated male pig is known as a barrow.

C. Castration of Sheep

All male lambs that are not to be kept as breeding rams should be castrated when they are from 7 to 14 days old. Healthy, thrifty lambs may be castrated and docked at the same time, with castration usually being done first. Very strict sanitary conditions should be followed when castrating lambs, and they should be placed in a clean, dry pen or on clean pasture following the operation.

The castrated male lamb is known as a wether.

D. Castration of Horses

A colt may be castrated at an earlier age, however, most horsemen prefer to postpone the operation until the animal is at least one year of age. Although there is less set back and less danger to the animal when early castration is practiced, leaving the colt as a stallion for a time will result in more muscular, bolder features. Also, it will result in better development of the foreparts.

There will be less danger of infection if colts are castrated in the spring when they are running on clean pastures. Regardless of the age, time, or place, castration should be done by an experienced veterinarian.

The castrated male colt is known as a gelding.

II. Methods of Castration

The methods and procedures used for castrating the different species of livestock will vary depending on the operator and the size and kind of animal being considered. Basically, there are two ways in which castration is performed: (1) Surgical removal of the testicles with the use of a knife or scalpel and (2) Bloodless castration by the use of either the burdizzo or an elastrator.

Transparency No. 1

A. Castrating with a knife or scalpel is the method most commonly used on cattle and sheep, and it is used exclusively on swine and horses. When castrating by this method, the operator should follow strict sanitation practices. He should disinfect all equipment and instruments used in the operation.

When castrating by this method, after the lower portion of the scrotum has been removed, or the sides of the scrotum have been slit by use of a knife or scalpel (whichever procedure is followed), then the membrane covering each testicle is slit and the testicles are pulled out. In older animals, excessive bleeding may be prevented through severing the cord by scraping with a knife or clamping with an emasculator. The action of the emasculator crushes the spermatic cord and artery and prevents blood hemorrhage. Two types of emasculators are shown, each of which performs essentially the same job, except the improved model has a double crushing blade. Before castration is performed, the area around the scrotum should be washed and scrubbed with soapy water (if needed), and a disinfectant should be applied to the area. Also, the operator should wash his hands before beginning the operation.

Transparency No. 2

B. Bloodless Castration

1. Burdizzo—Use of the burdizzo for the castration of cattle and sheep is a satisfactory method if done properly and by an experienced operator. This is a bloodless method in which the testicle cords are severed by use of the burdizzo. This operation destroys the channel of nourishment to the testicle, and after a time the testicle will wither away and be absorbed by the body. The skin is not broken and there is not an open wound through which infection may occur by this method.

2. Elastrator—The elastrator is an instrument used to stretch a specially made rubber ring over the scrotum of young calves or lambs. This stops the circulation of blood to the testicles and causes them to atrophy and drop off.

   This method is for use on smaller animals while application to animals too large for the practice may cause only partial stoppage of circulation, thus leading to infection and possible death loss.

III. Procedures for Castrating

The generally accepted methods of castrating and castrating equipment have been covered above, so in discussing procedures for castrating the different species of livestock all of the equipment will not be shown.

Transparency No. 3

A. Castrating Cattle

Any one of the three methods of castration discussed may be used for castrating bull calves. However, a majority of cattlemen use the knife, particularly when there is no danger of flies or screw worms.

Proper restraint of the calf at the time that castration is to be performed is important. When mechanical cattle handling facilities are available, the animal may be secured on a tilt table or a calf working table in a chute. Otherwise, restraint may be accomplished by stretching the animal between two poles by use of ropes or simply by hand restraint as shown on this transparency.

1. There are two methods of castrating cattle using the knife; the main differences among the two is the place of the incision or slit in the scrotum.
   a. The first method discussed will be the removal of the lower end of the scrotum. The bottom of the scrotum is held in the left hand, stretched tightly, and the bottom one-third of the scrotum is cut off. Thus, the ends of the testicles are exposed. The testicles are pulled out and cut

one at a time. The membrane covering each of the testicles may be slit before severing the cord for removal of the testicle, or it may be removed along with the testicle. Removal of the membrane eliminates the possibility of it collecting blood and forming a clot. The spermatic cord should be cut about three inches above the testicle. To prevent drainage restriction, which is caused by swelling and a curling up of the scrotum tissue, the scrotum may be slit on the sides. In older animals, six months or older, the cord may be severed with an emasculator, or the cord may be twisted and severed by scraping it back and forth with a knife or scalpel.

b. The second method is to slit each side of the scrotum on the outside next to the animal's leg. The incision or slit is made parallel to the middle line or membrane dividing the scrotum. It is important to extend the incision well down to the end of the scrotum to allow for proper drainage. The membrane surrounding the testicle may or may not be slit before removing the testicle, but a major portion of the membrane should be removed along with the testicle to keep it from collecting blood.

The testicles are removed by grasping and pulling them out. The spermatic cords are cut in the same way as described in the first method. In older cattle, excessive bleeding may be prevented by severing the cords with an emasculator. This method of castration is recommended for castrating animals while they are standing.

(Refer back to Transparency No. 2 for illustration of the Bloodless Methods of Castration.)

2. Both methods of bloodless castration may be used on cattle.
   a. To castrate the animal by the burdizzo method, the spermatic cord should be worked to the side of the scrotum and clamped about one and one-half to two inches above the testicles. The clamp should be held in a clamped position for a few seconds to make sure the cord is crushed. After clamping one cord, the procedure should be repeated on the other cord. If the cord is not completely crushed, the animal will develop a staggy looking appearance. The operator should allow the circulation of blood to the end of the scrotum. To allow for this circulation, an area should be left between the clamp marks made on the scrotum.
   b. The other bloodless method of castrating requires the use of an elastrator. The elastrator is an instrument used to place a rubber band above the testicles which stops the circulation of blood to the testicles and causes them to atrophy and drop off. This method of castrating, which is objectionable to some cattlemen, results in a smaller cod. Remember, this method is for use on smaller animals, preferably young calves under 2 months of age.

B. Castrating Sheep

Ram lambs may be castrated by the same methods used for castrating calves. Remember castration should be done when the lambs are from 7 to 14 days old. The castration should be done only on a bright clear day—never when it is damp and chilly.

Transparency No. 4

Restraint of a lamb for castration by the holder may be done in either a standing or sitting position. If the holder is in a standing position, the lamb's two right legs are held in the right hand, the two left legs are held in the left hand, and the lamb's back is held against the holder's body. Some operators prefer to have the lamb's rump resting on a castration table while being held in this position, particularly when docking is being done at the same time.

When the holder is in a sitting position as illustrated on the transparency, the lamb's legs are held in the same manner as described above, while the lamb's back is supported between the holder's legs.

1. Using a knife—The most common method of castrating lambs is to cut off the lower one-third of the scrotum. The testicles are then exposed by applying pressure at the base of the scrotum near the abdomen. The exposed testicles are removed by grasping them with either the thumb and crooked forefinger of the right hand or the teeth, and then pulling gently until the cord breaks.

   Following castration by this method, the proper precautions should be observed to protect the open wound against infection or fly infestation.

2. Bloodless castration may be performed on lambs by use of the "burdizzo" or an elastrator. When the burdizzo is used, the operator should use the recommended size for castrating lambs. Also, he should perform the operation carefully to observe that the spermatic cords are completely severed, otherwise lambs may become staggy as they grow older.

   The elastrator may also be used successfully for castrating lambs. Rubber bands are slipped over the scrotum near the base of the abdomen and circulation is cut off, thus causing the scrotum and testicles to gradually wither and drop off.

C. Castrating Hogs

There is no bloodless method of castrating hogs, and a knife or scalpel must be used to slit the scrotum.

Transparency No. 5

The method used to restrain hogs for castration will be determined by the size of the hog. The method shown on this transparency is satisfactory for restraining pigs. When mature boars are castrated, it is usually best to throw them and tie their legs. Sanitation is particularly important when castrating hogs.

Since the testicles of hogs are hard to hold and keep in place when castrating, the following explanation is given for holding them. If the hog is being held on its back, the right-handed operator should position himself next to the hog's right hind leg and face the under side or testicles of the hog. The finger next to the index finger on the left hand is used to push the testicle toward the rear of the hog. While pressure is applied with this finger, the testicle is gripped

with the index finger and the thumb. Using the right hand to hold the testicle, the left-handed operator would follow the same procedure from the opposite side of the hog. The testicle farthest from the operator should be removed first. An incision should be made on the scrotum over the testicle parallel to the median line. The length of the slit will be determined by the size of the testicle. After the slit is made, the testicle is pulled out and the spermatic cord is cut or scraped into. The procedure is repeated on the testicle next to the operator. Usually one stroke of the knife is required to cut the scrotum and membrane by the experienced operator. To prevent excessive bleeding in older hogs, the operator should use the emasculator to cut the cord. In fly season, apply an insect repellant to the wound.

D. Castrating Horses

Most authorities recommend that horses be castrated by a veterinarian. The time to castrate is important and should be determined by the horse's development. Most horses are castrated as yearlings, but those that develop slowly may be left entire for a longer period.

REFERENCES:

1. "Beef Cattle—Dehorning, Castrating, Branding, and Marking," U.S.D.A., Farmers Bulletin 2141.

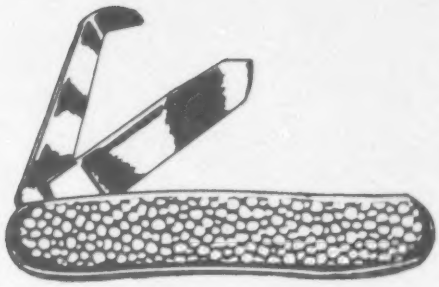
2. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Prentice-Hall, Inc., Englewood Cliffs, NJ.

3. Ensminger, M. E., The Stockman's Handbook, The Interstate Printers and Publishers, Inc., Danville, IL.

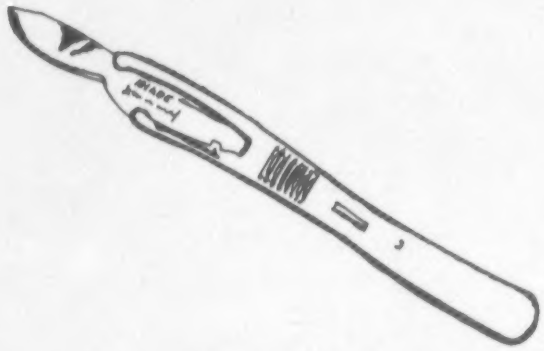
4. Ensminger, M. E., Animal Science, The Interstate Printers and Publishers, Inc., Danville, IL.

5. Leahy, John R. and Pat Barrow, Restraint of Animals, Cornell Campus Store, Inc., Ithaca, NY, 1953.

CASTRATION INSTRUMENTS

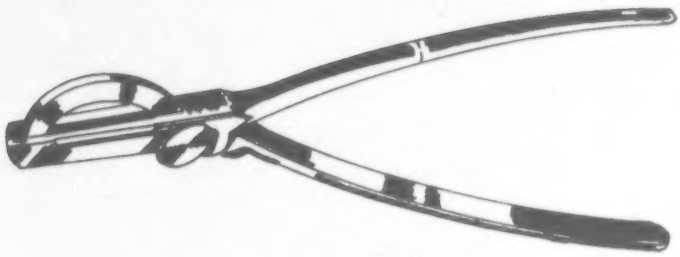


CASTRATION KNIFE



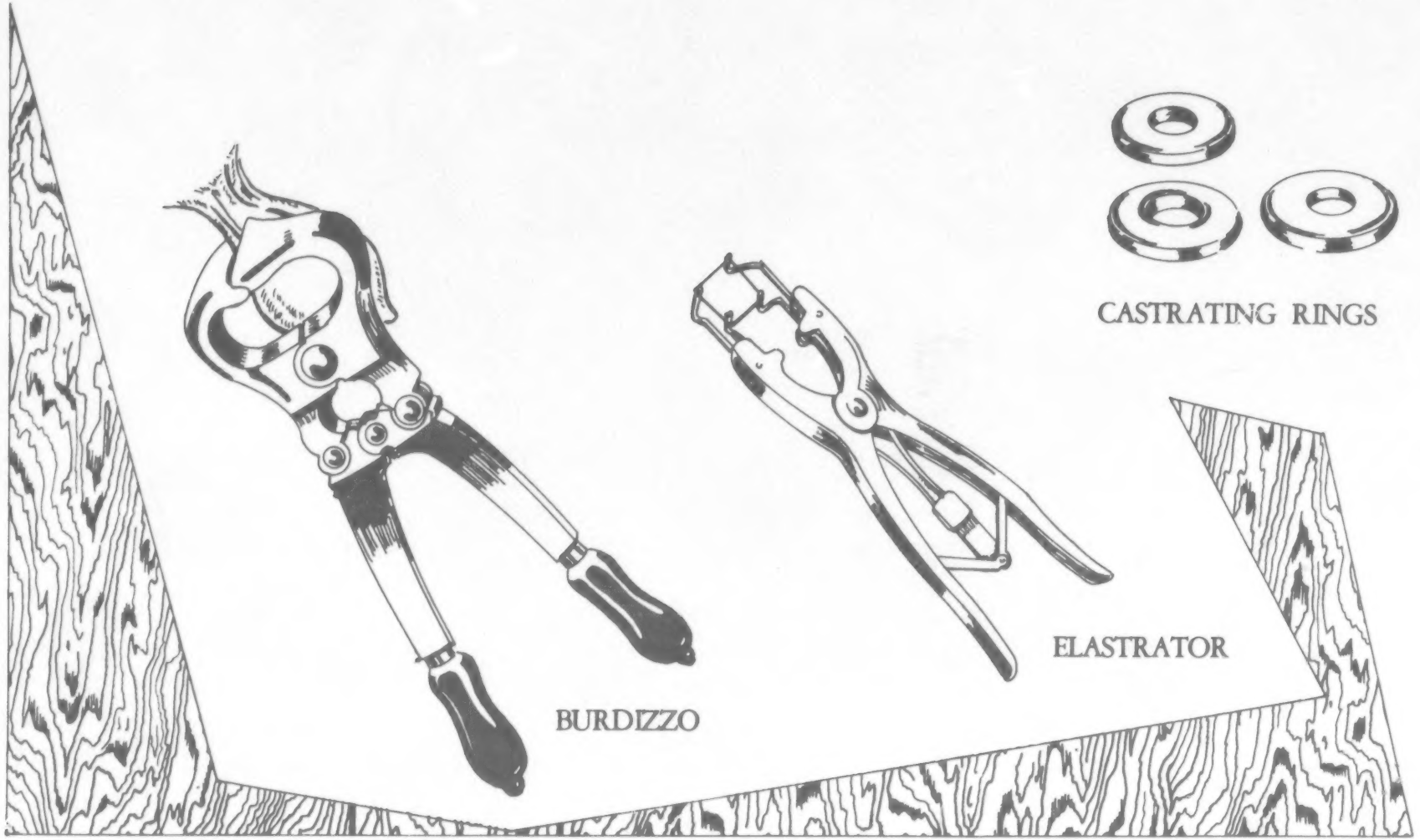
CASTRATION SCALPEL

IMPROVED EMASCULATOR



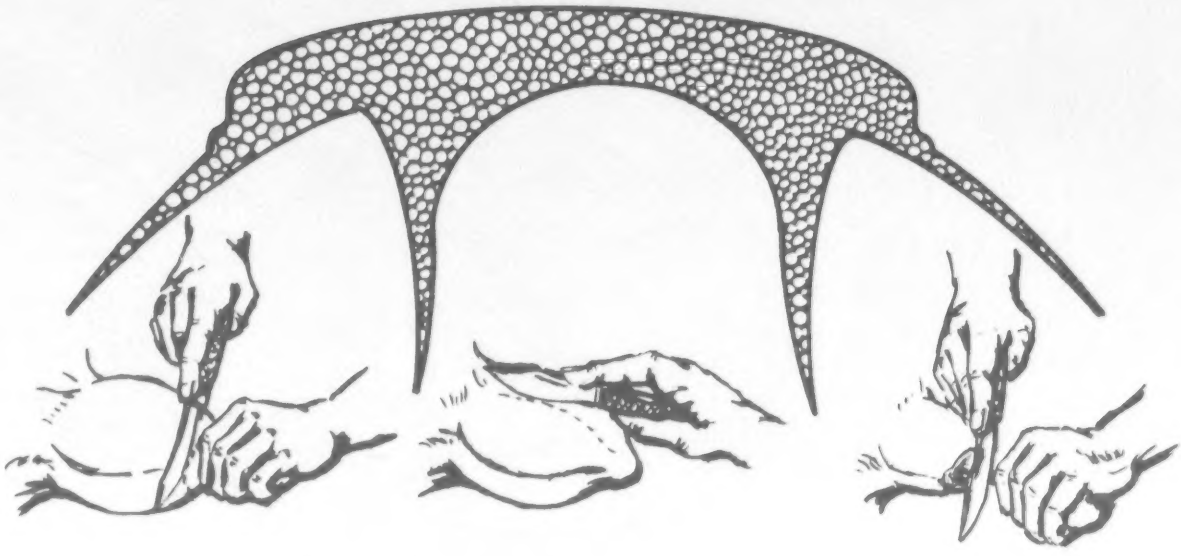
PLAIN EMASCULATOR

BLOODLESS METHODS OF CASTRATION



CASTRATING CATTLE

CASTRATING RESTRAINT



CASTRATING WITH A KNIFE

CASTRATING SHEEP

RESTRAINT

USE OF KNIFE

USE OF BURDIZZO

USE OF ELASTRATOR

CASTRATING SWINE

REMOVING TESTICLE

RESTRAINT

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 3: Dehorning

*Terms: All terms underlined are in the "Glossary of Terms."

I. Advantages of Dehorning

Because of the attractiveness of a properly trained set of horns, the purebred breeders of horned cattle do not dehorn; however, most commercial cattlemen prefer that their cattle be dehorned. Some of the advantages of dehorning cattle are as follows:

A. Less feed and shed space are required for dehorned cattle.
B. Equipment for handling cattle needs fewer repairs and lasts much longer with dehorned cattle.
C. Dehorned cattle have fewer bruises; horned cattle, both beef and dairy, inflict more injuries to other cattle in the herd; there are definitely fewer udder injuries in dairy herds of dehorned cattle.
D. Dehorned feeder cattle tend to gain faster, are quieter, and are easier to handle.
E. There is less chance of injury to the stockman handling dehorned cattle.
F. Dehorned cattle usually sell for one to two cents per pound more than horned cattle.

II. Age to Dehorn

Age is an important factor in dehorning and often determines the method to be used. Young animals are easier to handle than older ones. The after effects younger calves suffer are usually slight, and when done properly the first time, never needs repeating.

Since the Southwest Animal Health Research Foundation, with the stockmen's assistance, is successfully controlling the screw worm, the stockman has more flexibility in selecting the time to dehorn. However, he should select a cool, sunshiny day for the operation.

III. Methods of Dehorning

The method a stockman will use to dehorn will be determined by the age of the animal, the size of their horns, equipment available, and available labor. The two methods of dehorning may be classified as chemical and mechanical.

A. Chemical Dehorning

Transparency No. 1

The use of chemicals to burn the horn buttons and prevent growth is more successful when used on calves before they are ten days old. The most commonly used chemicals are caustic soda or potash, and they are usually available in a paste or stick form. The caustic should be applied with caution to prevent injury to the stockman and excessive burning to the animal. The caustic method of dehorning is used mostly in small, closely supervised herds.

To prepare the calf for dehorning, the stockman should clip the hair around the base of the small, undeveloped horns or buttons and apply about a one-half inch band of petrolatum on the hair at the base of the horn button. The petrolatum will prevent the caustic from severely burning the skin. If the caustic stick is to be used, the stockman should wrap paper around one end of the stick; and the stick should be held by the paper. Either the stick or the horn button should be moistened, and the horn button should be rubbed with the stick. Excessive moisture, either on the stick or horn button, will cause the caustic to run. If the paste is used, a stick may be used to apply the paste. Using the stick or the paste, the stockman should apply about 1/16 inch thickness of caustic to the horn button.

B. Mechanical Dehorning

Instruments used for dehorning should be cleaned and disinfected before and after each operation to prevent the introduction and spread of infections and contagious diseases. This is especially important where anaplasmosis is prevalent or suspected.

The instruments should be washed in cold water to remove blood. After the instruments are washed, they should be soaked in a disinfecting solution. A solution of four ounces of cresol to one gallon of water makes a good disinfecting solution.

The type of dehorner used will determine how the cattle are handled. If the cattle are going to be worked in a squeeze chute, the operation is simplified because the cattle do not have to be held by hand or thrown.

Transparency No. 2

1. Hot Iron Dehorning

There are two kinds of hot iron dehorners; those that are heated by electricity and those dehorners, called dehorning coppers, that are heated by some kind of fuel. Regardless of the type used, the stockman should select one that is

large enough to cover the horn button. Most electric dehorners are available in only one size, but the copper irons can be purchased in several sizes.

Hot irons can be successfully used on calves after they have passed the button stage and until they are two to three months of age. One of the best methods of restraining the calf for dehorning with the hot iron is to place the calf against a good board fence, and with the halter rope, pull the calf's head above his body so that he can place very little of his weight on his front feet.

After the irons are heated, the stockman should place the dehorner over the horn and hold the hot iron firmly against the head for 15 seconds. This destroys the horn growth cells around the base of the horn, and the horn will usually slough off in about a month to six weeks.

2. Spoon and Tube Dehorners

Dehorning spoons and tubes are recommended for use on calves up to about three months of age. At this age the horns are still skin appendages and can be scooped out rather easily. Dehorning tubes vary in size and can usually be bought in sets of four. The tube should be large enough to fit over the horn and cover about 1/8 inch of skin around the horn.

Placing the cutting edge straight down over the horn, the operator should push and twist the tube until the skin has been cut through; then he should use the cutting edge of the tube to cut under the horn button and to remove it.

The dehorning spoon or gouge is used to gouge out the horns on young calves. With a little experience, a stockman can do a fast and efficient job of dehorning with the spoon.

3. Elastrators

The elastrator, an instrument used to stretch a special rubber band, has been used in dehorning cattle. The rubber band is put over the horn and placed into the hair line. This method of dehorning is used on cattle with horns from three to six inches long. Some cattlemen have been disappointed with the results they have received from this method of dehorning.

Transparency No. 3

4. Barnes-Type Dehorners

Barnes-type dehorners are available in two sizes. The smaller size is used on calves four to eight months of age, and the larger size is used to dehorn yearlings or older cattle.

When using this type of dehorner, the stockman should restrain the animal in such a manner that enough pressure may be applied to properly use the dehorner. To use the Barnes-type dehorner, the stockman should close the handles and fit the knives over the horn. The knives should be positioned so that they will remove a ring of skin with the horn. After the dehorner is placed in the proper position, the operator spreads the handles apart quickly, thus closing the knives and removing the horn.

5. Dehorning Clippers

Dehorning clippers are preferred by most stockmen because they are faster, easier to use, cause less pain to the animal, and make a smoother cut. Saws should be used on abnormally large horns and on older cattle when there is a possibility that the clippers will crush or sliver the horn. An electric saw dehorner, which is similar to a portable electric wood saw, can now be purchased. The animal can be dehorned much faster with this type of dehorner, but it is expensive and difficult to disinfect.

When using the clippers, the stockman should place the opened blade over the horn so as to remove about 1/2 inch ring of skin with the horn. The deep cut destroys the modified skin cells from which horns grow. After the clippers are placed in the proper position, the stockman should quickly close the handles and clip off the horn.

6. Dehorning Saws

If either hand or electric dehorning saws are used, the operator should cut deep enough to remove a ring of skin and prevent later growth of abnormal, unsightly horns. If the stockman so desires, a local anesthetic can be administered to eliminate the pain caused by the saw in the dehorning operation.

IV. Preventing Excessive Bleeding

There are several recommended methods of preventing excessive bleeding in animals dehorned by a mechanical method that causes bleeding.

The operator may use gauze or tissue paper and a commercial blood stopper to prevent excessive bleeding in young animals. The gauze or paper is folded into a pad several layers thick and about $2\frac{1}{2}$ inches in diameter. After the blood stopper has been applied, the operator places the pad over the dehorn wound and holds the pad in place for a short time. The pad, which causes the blood to clot, is usually held in place by the dry, clotted blood.

Bleeding in larger animals can be minimized by using forceps to pick up the main artery on the ventral, or underside of the cut. The artery should be pulled until it breaks; the broken artery will retract and go back into the soft tissue, thus stopping the bleeding.

V. Care of Animals After Dehorning

The animals should be kept in a small pasture or trap for the first week after dehorning. The stockman should observe the animals periodically for infection. There is a tendency for animals to become wild after dehorning. To gentle the animals, the stockman should feed a small amount of feed each day while they are in the small pasture.

REFERENCES:

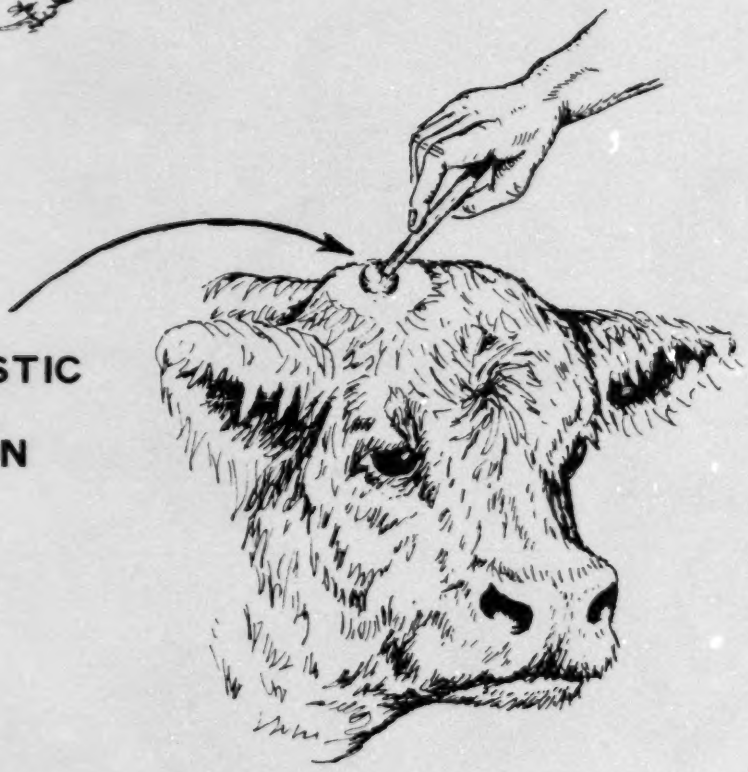
1. "Dehorning, Castrating, Branding, and Marking," U. S. Department of Agriculture, FB-2141.

2. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.

CHEMICAL DEHORNING

CLIP HAIR &

APPLY PETROLATUM



APPLY CAUSTIC

TO BUTTON

DEHORNERS

hot iron

electrical

DEHORNING IRONS

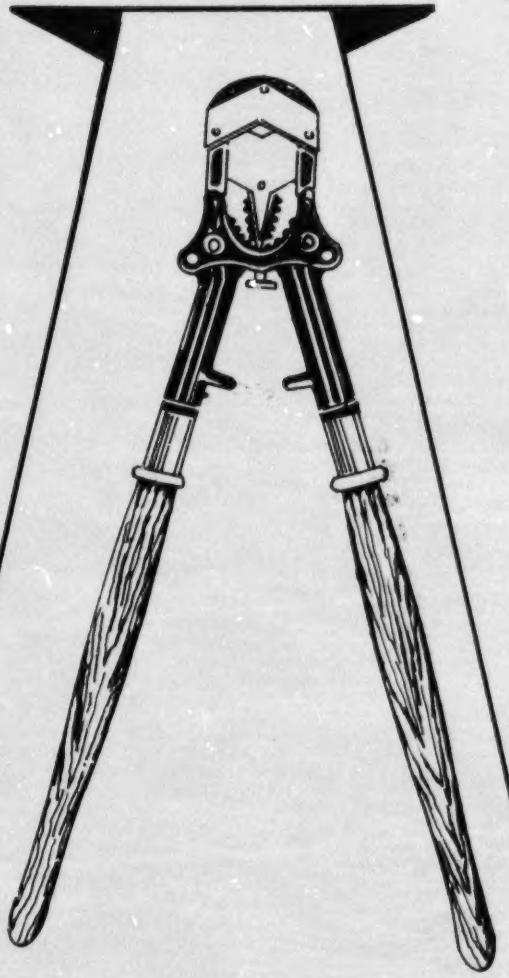
METAL SPOON OR GOUGE

TUBE DEHORNER

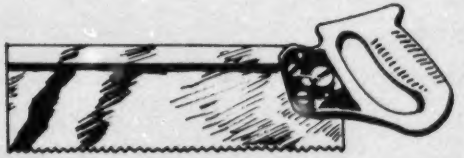
ELASTRATOR

DEHORNERS

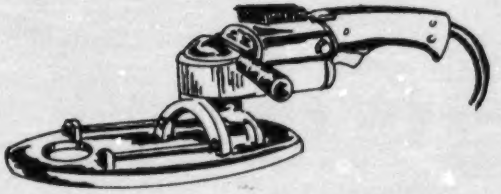
"BARNES TYPE"
DEHORNER



DEHORNING CLIPPERS



hand



electrical

DEHORNING SAWS

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 4: Branding, Marking, Ear Notching, Tagging, and Tattooing

*Terms: All terms underlined are in the "Glossary of Terms."

I. Importance of Animal Identification

Branding and marking of livestock to give a permanent mark of identification and to establish ownership has been practiced since early times. The first branding used in some parts of the world was for the purpose of permanently marking human criminals. Early livestock producers used other methods in addition to branding to identify their animals; some of these were dewlap tag brands, wattles, and ear marks. Branding, marking, ear notching, tagging, and tattooing are the principal methods used to identify animals today.

Even though there have been many changes in the production of livestock most cattlemen still brand. For fast easy identification, purebred breeders of horned cattle horn brand, and breeders of polled cattle either hide brand, use neck chains, or use ear tags. Most commercial cattlemen, particularly those with large herds, brand their livestock.

All livestock producers take great pride in their brands, for this is a symbol of quality, service, and integrity. Also, it is necessary for many commercial stockmen to brand so that they can keep accurate herd records.

II. Branding

All kinds of livestock may be branded; however, more cattle are branded than any other kind. While cattle may be branded at any age, younger cattle are easier to handle. It is a practice in the western states to brand, castrate, and vaccinate at the same time; this practice eliminates the handling of animals more than once. Calves that are kept as replacements are branded, while those to be sold are not.

There are two general types of branding irons, "running irons" and "stamping irons." Whether letters, numerals, or characters are used, they should be easily made and constructed of steel or copper. Hot irons should be made from steel or copper stock large enough to hold the needed heat. Three-eighths inch stock is recommended. Irons used for freeze branding can be made from steel or copper, but copper irons cool faster and transfer the cold more rapidly. Handles on hot irons should be long enough, two to two and one-half feet, to permit easy handling. Irons used for liquid branding may have shorter handles and are usually curve faced.

Most states require that brands be recorded with the state, but in Texas the county is responsible for recording brands. The stockman should have his brand and earmark recorded in all counties in which he is grazing livestock.

In state programs to eradicate bovine tuberculosis and brucellosis, official inspectors are required to brand animals. Animals that react to the tuberculin test are branded on the left jaw with a letter T; those that show a positive reaction to the test for brucellosis are branded on the left jaw with a letter B.

The brand should be located so that it can be easily seen and applied but placed in an area that will cause the least possible hide damage. A brand that is approximately four inches tall is considered large enough, especially if the animal is branded while young.

Transparency No. 1

The threemethods used to brand livestock are a hot iron, a commercial branding fluid, and a freeze brand. Regardless of the method used, the animal should be dry when branded. Branding a wet animal with a hot iron will leave a blotch, a scald, a bad sore, or no imprint at all. If a wet animal is branded with the liquid branding fluid, the fluid will run, cause excessive burning, and probably mar the brand.

A. Hot Iron Branding

Two kinds of hot irons may be used for branding: the electric branding iron and those that require fuel to heat them.

After the animal has been restrained in such a manner that the brand can be applied and the iron has attained the proper heat (ash gray for steel irons heated with fuel), the stockman, being careful not to let the iron slip, should hold the iron to the animal's skin long enough to scorch the skin surface. A good brand will peel and remain distinct. Deep burning is cruel and unnecessary.

Using a much smaller iron, the stockman should follow the same procedure for horn branding as that used for hide branding. Horn branding of older animals is usually successful, but the branding of animals with growing horns usually has to be repeated.

B. Liquid Branding

To prepare the animal for liquid branding and to secure the best results, the stockman should clip the hair from the area on the animal where the brand will be applied.

The branding iron is dipped in 1/8 to 1/4 inch of commercial branding fluid and pressed against the skin for a few seconds. It is difficult to control the depth of burning with a liquid branding fluid. If too little is applied, the imprint will soon disappear. If too much is applied, a bad sore will result, or the spreading of the excess liquid will cause a blurred imprint. Liquid branding is generally not considered as satisfactory as hot iron branding.

C. Freeze Branding

Freeze branding is a recently developed method of branding that appears to be a successfullmeans of permanently marking animals for identification. Laws in some states specify that animals must be hot iron branded; it will be necessary to change the laws before freeze branding can be used in these states.

To prepare the fluid necessary for freeze branding, the stockman should use golf ball size chunks of dry ice and pour denatured alcohol over the ice. The proportion of dry ice to alcohol does not have to be accurate, and only enough alcohol is needed to cover the characters of the branding irons. Enough ice is needed to chill the alcohol. To avoid sludge in the mixture, the stockman can use any of the following alcohols: 95% methyl, isopropyl, ethyl, or acetone. The mixture stabilizes at 90 degrees; at this temperature evaporation of the alcohol is negligible. As the dry ice and alcohol are mixed, the mixture will bubble and foam for two or three minutes; the mixture is ready for branding after it stops bubbling and foaming.

In preparation for branding, the hair should be clipped from the area to be branded. Too much hair forms an insulating barrier that often causes poor results. To prevent the cold iron from sticking to the animal, the stockman should prepare the area to be branded by wiping it with alcohol. The branding irons should be left in the solution for two or three minutes or until they are chilled. The iron is held on cattle for 30 seconds and on horses for 20 seconds. Holding the iron to the animal for this length of time will destroy the color producing cells, called melanocytes, and will cause the hair to grow out white. The hair will not turn white immediately, but the new hair which grows from the brand will be white. This process will not brand a white animal; however, if the stockman will hold the iron to the white animal's skin for 50 seconds, the hair follicles will be destroyed. The hair will fall out and leave a clean, hairless brand.

A freeze brand is much easier to apply than other brands, and it does not destroy the hide where the brand is applied.

III. Marking Animals

It is a common practice to earmark cattle, sheep, goats, and swine. Earmarks are secondary to brands but should be recorded along with the stockman's brand, which is protected by law. While it is often impossible to get the side view of an animal, the stockman marks his animals so that he can identify them from the direct front or rear. For this reason, marking is about as widespread as branding.

Transparency No. 2

Since the cartilage of the ear is tough, the stockman must use a sharp knife to get a clean cut.

IV. Ear Notching

Ear notching is a system of numbering animals that is required by some breed associations in addition to the requirement that the animals be tattooed or ear tagged. Ear notchers may be purchased in several different sizes.

Transparency No. 3

A simple ear notching system and one that is recommended by one of the major swine breed associations is as follows: The system consists of four numbers—one, three, ten, and thirty.

a. One notch in the lower right ear is number 1.
b. One notch in the lower left ear is number 3.
c. One notch in the upper right ear is number 10.
d. One notch in the upper left ear is number 30.

If a producer will remember these four notches and the numbers they stand for, he can recognize a number or identify an animal instantly. The following is an example of the above numbering system: To number an animal eighteen, a stockman would notch the upper right ear for 10, make two notches in the lower right ear for 2, and make two notches in the lower left ear for 6.

The term "lower refers to the "outside" or bottom side of the ear, and the term "upper" refers to the "inside" or top part of the ear.

Transparency No. 4

V. Ear Tags

The ear tag, usually made from either metal or plastic, is another method of identifying animals and is required by some breed associations. Special instruments are required to apply most ear tags which contain the owner's name or initials, the animal's number, and the year the animal was born. Ear tags are easy to apply, and they are also easy for animals to lose and should not be considered a permanent identification.

VI. Tattooing Livestock

The tattooing of livestock is a permanent method of identification required by most purebred cattle breed associations, and lip tattooing of horses is required by the Jockey Club.

The tattooing of cattle is done with a special instrument that places characters, letters, or numerals in and under the skin of the ear by means of a series of needle like points.

The stockman should disinfect the tattooing instrument and clean all the wax from the area to be tattooed. The tattoo should be placed in the center inside of the ear and not on a midrib or blood vessel. Placing the tattoo in a blood vessel will cause excessive bleeding, and it will become indistinguishable and

blurred. After a special indelible ink is applied to the needle like points, the instrument is placed in the ear and pressure is applied so that the points perforate the ear. The stockman should rub indelible ink, which will give a permanent tattoo, into the perforations.

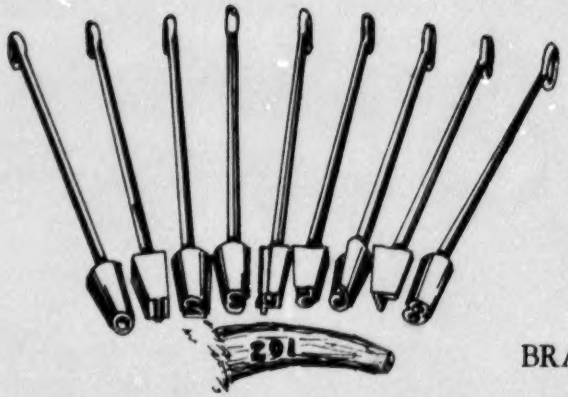
Horses are tattooed in the same manner, but the tattoo is placed on the inside of the upper lip.

REFERENCES:

1. "Dehorning, Castrating, Branding, and Marking," U. S. Department of Agriculture, FB-2141.

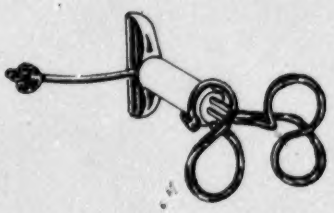
2. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.

METHODS OF BRANDING LIVESTOCK



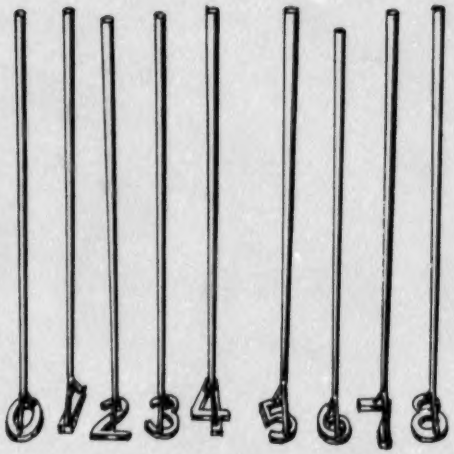
HORN IRONS

BRANDING IRON HEATER



ELECTRIC IRON

1 Hot Iron Branding



STEEL OR COPPER IRONS

LIQUID NITROGEN TANK

COPPER IRON

2 Freeze Branding

3 Liquid Branding

COMMON EAR MARKS

UNDER BIT

OVER BIT

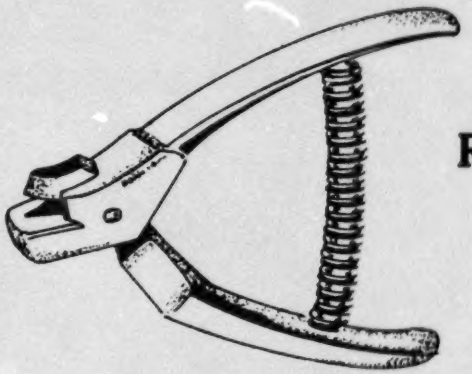
SWALLOW FORK

SPLIT

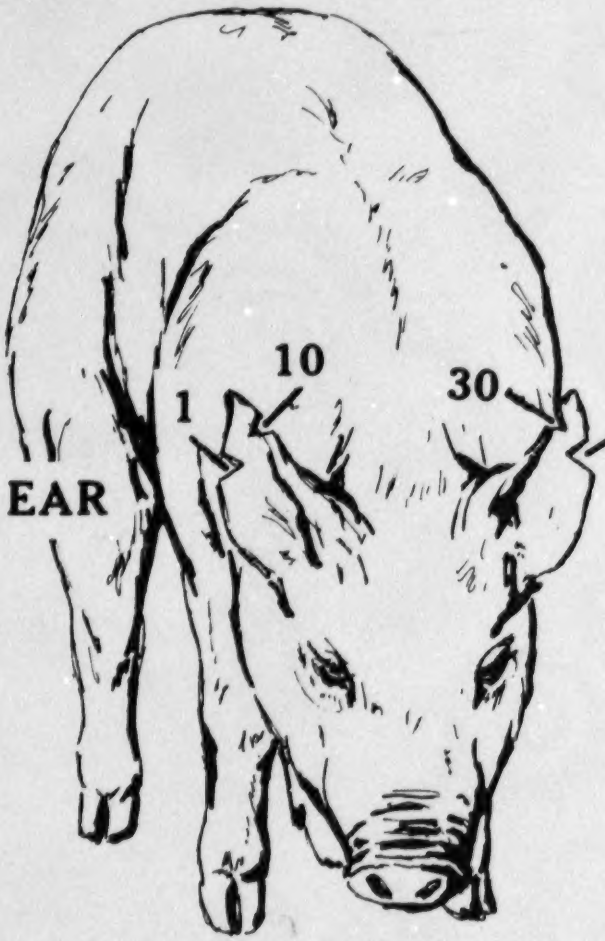
BOBBED

TIPPED

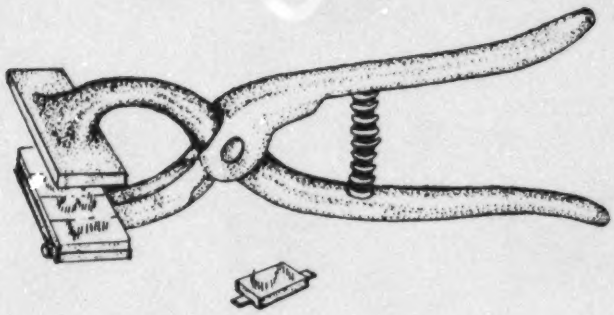
EAR NOTCH NUMBERING SYSTEM



EAR NOTCHERS

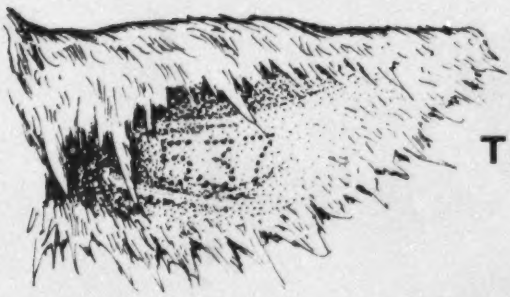


TATTOOING



TATTOOING PLIERS

TATTOO INK



TATTOO IN EAR

EAR TAGGING

METAL OR PLASTIC TAG

RUBBER TAG

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 5: Docking Sheep

*Terms: All terms underlined are in the "Glossary of Terms."

I. Docking Sheep

Docking improves the general appearance of sheep, eliminates the constant threat of flies, and makes it easier for ewes to breed. Buyers prefer to purchase docked sheep.

It is usually best to dock sheep at an early age, two months or less, because there is less shock and healing is much faster; however, older sheep may be docked. The rancher should select a cool, sunny day to dock; and to eliminate excessive handling, he may dock at the same time he castrates. Since the organization of SWAHRF and the near control of the screw worm, the stockman has more flexibility in the selection of days to dock and castrate.

There are several methods of restraining a lamb for docking. One method is for the holder, holding the lamb's right legs with his right hand and the left legs with his left hand, to stand upright while pressing the lamb's back against his body. The holder may hold the legs in the same manner while seated, or the holder may hold the lamb's legs in the same manner with the lamb's buttocks resting on a table or docking stool. The stockman who doesn't have an assistant may restrain the lamb by holding it in a standing position while exerting pressure on the lamb with his legs. The stockman and the lamb should be facing opposite directions; thus, the stockman is in the position to bend over and dock the lamb.

All instruments used in docking should be disinfected before their use. If cutting instruments are used, they should be disinfected after the docking of each lamb.

When using a method of docking that causes bleeding, the stockman should push the skin toward the lamb's body so there will be a surplus of skin to cover the stub. Usually the dock will heal faster with a skin covering.

The tails of ewe lambs are left about two inches long, while the tails of wethers are usually cut four to six inches long. This makes the sexes easier to separate because they are readily distinguishable in the flock.

Transparency No. 1

II. Methods of Docking

There are several methods that may be used to successfully dock lambs, and there are advantages to each method. The method used will be determined by the stockman's preference. An explanation of several of the most popular methods follows:

A. Docking with a Knife

After the joint to be cut is located, the stockman should twist the tail a quarter turn before cutting it off with a knife. This will give a diagonal cut across the blood vessel and will increase the possibility that the blood will clot quickly. If pruning shears, which are the docking instrument preferred by some stockmen, are used, the tail should also be twisted before cutting it off.

B. Docking with the Burdizzo

When docking lambs with burdizzos, the stockman places them on the tail at the point where the tail is to be severed and closes the burdizzo. The tail is cut off inside the closed jaws of the burdizzo. After the tail is removed, the burdizzo should be held in place for a few seconds to prevent excessive bleeding.

C. Docking with the Emasculator

The emasculator, which crushes the tissue as it cuts, lessens the loss of blood; it is closed on the tail at the point where it is to be docked.

D. Docking with the Elastrator

The elastrator is an instrument that stretches special rubber bands over the lamb's tail and provides a bloodless method of docking. To dock the lamb, the stockman, leaving the band at the point where the lamb is to be docked, releases the pressure on the band and frees the elastrator. The band cuts off the supply of blood and atrophy follows. Some stockmen cut the tail off below the rubber band after it has been on the tail for nine to eleven days. Four to eight weeks, depending on the size of the lamb, are required for the lamb's tail to fall off below the rubber band.

E. Docking with a Hot Iron

The hot iron used for docking lambs is usually shaped like a chisel. After the iron is heated to a dull red color, the stockman, to protect the lamb's buttocks, places its tail through a hole in a board and severs the tail with the hot iron. This method of docking reduces the loss of blood and lessens the danger of infection, but requires longer to heal.

III. Treatment

There are several antiseptic solutions used to treat the dock; but the stockman should not treat the dock with a screw worm smear, as this causes stiffness in some lambs.

REFERENCES:

1. Bundy, Clarence E. and Ronald V. Diggins, Sheep Production, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1958.

2. Ensminger, M. E., The Stockman's Handbook, Fourth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1970.

3. Ensminger, M. E., Animal Science, Sixth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.

DOCKING LAMBS

RESTRAINT

SLIPPING SKIN
FORWARD

REMOVAL
USING EMASCULATOR

ANIMAL SCIENCE

Unit B: Handling Livestock

Topic 6: Injection Procedures

*Terms: All terms underlined are included in the "Glossary of Terms."

I. Importance of Vaccines, Bacterins, and Serums

To understand the importance and value of vaccines, the livestock producer must be acquainted with the organisms that cause diseases.

When an animal becomes sick because of interference with proper body and cell functions, microbes, often called microorganisms, invade the body and overcome its natural defenses. Pathogenic microbes, which cause disease, vary in size and are found in large numbers. It has been estimated that there are more microorganisms in a small amount of soil than there are people on the earth. However, most of the microorganisms are helpful to plants and animals.

After the microbes enter the animal's body, they consume body cells and fluids and cause a poison, called toxins, to develop in the body. The increase in the number of microbes in the body varies with the kind of disease, the strength (virulence), and the animal's resistance. Microbes also are able to multiply and increase so rapidly because of their high rate of metabolism, which allows them to consume many times their size in the consumption of food, body cells, and fluid.

As the microbes enter the body, several kinds of body forces combine in an attempt to kill the invaders and neutralize the toxins. These body forces, called antibodies, are made from body cells and tissues. Their job is to kill the microbes. The animal is immune to a disease from which it has recovered if its cells continue to make antibodies. Scientists reasoned that if antibodies protect an animal against disease, the injection of antibodies into a susceptible animal would give this animal immunity. This idea has saved millions of animals, as well as human beings.

Vaccines, bacterins, and serums are used to produce immunity. Vaccines, which are made from living germs, give the animal a mild attack of the disease; antibodies are produced and immunity is obtained. Bacterins, which are similar to vaccines, are made from dead organisms and are stored in oil or water that contains the same amount of salt as the body fluids. Bacterins also cause the body to make antibodies. Serums are produced when plasma and fibrinogen have been removed from blood. Serums give only temporary immunity to the animal because their injection into the body does not cause the body forces in the animal to make antibodies.

Different microbes prefer different kinds of environment; some live only in the presence of air, and others can live without air. Under suitable conditions microbes form spores. These spores can live several years without food under adverse conditions, such as extreme heat and cold. Many diseases are perpetuated by spores. Most microbes multiply by simple division; when reaching a certain size, they divide in halves.

Another form of microscopic life which causes diseases in livestock is called bacteria, a one-celled plant. The three kinds of bacteria are Bacilli, Cocci, and Spirilla.

Viruses also are responsible for many livestock diseases; many of the diseases caused by viruses can be controlled by vaccines.

II. Injection Procedures

A. Factors to Consider in Handling Biological Products

Transparency No. 1

To acquire better immunization in livestock, the stockman should consider the following factors for handling biological products:

1. Biological products should be protected from heat and light, and they should be kept in a refrigerator at 35° to 45° F. Vaccines should not be frozen.
2. If vacuum-dried vaccines are being used, they should be used immediately after being mixed with the sterile diluent.
3. Animals should be properly restrained.
4. The biological product should be used when first opened. Unused vaccine may become contaminated.
5. Sterilized instruments should be used.
6. Uniform suspension may be obtained by shaking the vaccine.
7. The recommended dosage should be given.
8. No attempt should be made to immunize diseased or unhealthy animals.
9. Instructions should be read carefully.

Antibiotics and other drugs, used as injections for disease control, are handled and stored by most livestock producers. Federal regulations require licensed manufacturers of all veterinary products to label the container or supply the buyer of the products with information on the proper methods of handling and storing the products. These instructions should be read and followed carefully.

B. Kinds of Injections

There are several kinds of injections that may be used to prevent disease and produce immunity in animals. The livestock producer should be familiar with the different kinds of injections and the terminology used to describe each.

Transparencies No. 2 and 3

1. Paraexteral Methods of Injections—Any method other than in the intestinal tract.
2. Cutaneous—The material is applied to the skin or rubbed into the skin.
3. Intracutaneous or Intradermal—Injected into the skin.
4. Subcutaneous—Injected just under the skin.
5. Intravenous—Injected into a vein when fast action is wanted.
6. Intramuscular—Injection is made into large muscles. Muscles in the neck and thigh are commonly used.
7. Intracardial—Injected directly into the heart.
8. Intrathoracis—Injected into the thorax. Not commonly used.
9. Intraocular—Under the eyelid, into the cornea, or into the anterior chamber.
10. Epidural—Directly into the spinal canal.
11. Intrapulmonary—Injected into a lung.
12. Inhalation—Vapor or dust is inhaled.
13. Oral—By mouth or injected through a stomach tube.
14. Rectal (Enema)—Injected into the rectum.
15. Intramammary—Injected into the mammary gland.
16. Syringe—Instrument used to make injections, consisting of plunger, barrel, and various types and sizes of needles.
17. Stomach Tube—Tube to pass materials directly into stomach. May be inserted through mouth or nostril.

The injection used to prevent disease or to induce immunity in animals or poultry depends on the kind and amount of solution used and the animal involved. Most injection materials will be measured in cubic centimeters, commonly referred to as "cc's."

The temperature of materials to be injected and the syringes and needles should be near body temperature, but never higher. Some injections such as serums may be given at body temperature or at a colder temperature.

C. Some Instruments Used for Injections

Transparencies No. 4 and 5

Several different types of syringes are available, and the size of syringes vary from those that hold a few cc's to those that will hold as much as 50 cc's. Syringes are made from metal, plastic, or glass.

Hypodermic needles are of two kinds, those that are used once and disposed of after use and those that may be sterilized and used again. Hypodermic needles are also available in several different sizes; the size is determined by the gauge and the length of the needle. The smaller the gauge, the larger the needle will be. The length of a hypodermic needle is specified in inches.

D. Preparing for the Injection

Before making an injection, a stockman should make certain preparations. A sharp needle of the proper size, which is determined by the method of injection to be applied, should be selected. Instruments should be sterilized before being used. They may be sterilized by boiling them in water for fifteen minutes or by soaking them in a 70% alcohol solution. If injections are made in several animals, the needle or instrument used for the injection should be sterilized before each injection.

To eliminate the possibility of forcing unwanted microorganisms in the animal's body, the stockman should clip or shave the hair and clean the area where the injection is to be made with an antiseptic solution.

Before filling a syringe for an injection, the stockman should carefully read the instructions that come with the vaccine. The syringe is filled by pulling the plunger out to allow air to fill the syringe, then the needle is pushed through the disinfected stopper. The bottle is inverted and the air forced from the syringe by depressing the plunger. The plunger is slowly pulled out until the barrel is filled to the desired level. The needle is removed from the bottle while the syringe is held with the needle up; in this way, air bubbles are forced from the barrel. Another method of filling the syringe that might be used if more than one injection is to be given is to leave the needle in the stopper of the bottle and attach another sterile needle to the syringe before each injection.

E. How to Make Injections Properly

Transparencies No. 6 and 7

Injections of various medicinal agents are commonly administered by stockmen. Such injections are a convenient and accurate means of treating sick animals or administering vaccines, serums, and bacterins.

1. Subcutaneous Injections (Sub Q)
   Subcutaneous injections may be made in any area over which the skin fits loosely such as the neck, chest wall, "armpit" or flank. A small area is cleansed with alcohol and the needle inserted through the skin and the syringe contents discharged. A fold of skin may be picked up to facilitate entry of the needle. Following the injection, the area may be massaged to facilitate distribution.
2. Intramuscular Injection (IM)
   Intramuscular injections should be made deeply into a large muscle (thigh, shoulder or neck). Cleanse an area as outlined above and insert the needle deeply into the muscle. Use a needle at least 3/4" in length for cattle, sheep, and swine.

3. Intraperitoneal Injection (IP)
   Used mainly for the administration of large quantities of fluid such as Calcium Gluconate, Dextrose, Triple Sulfa, etc., for cattle. (1) Use a long needle—16 gauge x 2" or 14 gauge x 3". (2) Warm the solution to body temperature prior to administration. Insert the needle into the right flank at a point in the center of the triangle formed by the loin, last rib, and a line from the top of the last rib to the hip bone. Use sterile precautions.
4. Intrarumen Injection (IR)
   Used to administer medication promptly in bloat. Always insert needle through the LEFT flank. Use 14 gauge x 3" needle. Proper position of needle is noted by return through the needle of gas or liquid from the stomach.
5. Intradermal (ID)
   Injection is made with a 20-26 gauge needle into the skin. Proof of intradermal injection is a blister raising consisting of ingredient injected. Hair should be shaved previous to injection.
6. Intramammary (IMM)
   The infusion can be accomplished by disinfecting the teat, depressing the teat to open the sphincter muscle, inserting the sterile canula, and forcing the medication into the teat canal from the syringe or tube. Disinfect the teat after infusion.
7. Intravenous (IV)
   This injection is done into a vein—most commonly the jugular vein. This vein is located in a groove that is located from the back point of the jaw bone and angles to the point of the shoulder on either side of the neck. Applying pressure by tourniquet or thumb pressure cutting off the blood flow, and this enlarges the vein to visible size. Disinfect and insert needle through the skin into the vein. Once into the vein, the needle should be directed upward towards the head inside the vein. Always check for blood flow before attaching the intravenous tube and allowing medication to enter blood stream. The flow of product should be slow.

REFERENCES:

1. The Merck Veterinary Manual, Third Edition, Merck and Company, Inc., Rahway, NJ, 1971.
2. Animal Diseases, 1956 Yearbook of Agriculture, Superintendent of Documents, Washington, DC (Usually available from your congressman.).
3. Veterinary Handbook, Ninth Edition, Anchor Serum Company, St. Joseph, MO—Indianapolis, IN.

4. Prevention and Control of Livestock Diseases, 1969 Vaccine and Supply Catalog, Cutter Laboratories, Inc., Berkeley, CA.

5. Franklin Vaccine and Supply for Livestock, Catalog No. 68, O. M. Franklin Serum Company, Denver, CO.

6. Ensminger, M. E., Animal Science, Sixth Edition, The Interstate Printers and Publishers, Inc., Danville, IL, 1969.

7. Bundy, Clarence E. and Ronald V. Diggins, Livestock and Poultry Production, Third Edition, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1968.

FACTORS TO CONSIDER IN HANDLING BIOLOGICAL PRODUCTS

1. BIOLOGICAL PRODUCTS SHOULD BE PROTECTED FROM HEAT AND LIGHT, KEPT REFRIGERATED AT 35° TO 45° F., AND SHOULD NOT BE FROZEN.

2. VACUUM-DRIED VACCINES SHOULD BE USED IMMEDIATELY.

3. ANIMALS SHOULD BE PROPERLY RESTRAINED.

4. THE BIOLOGICAL PRODUCT SHOULD BE USED WHEN OPENED TO PREVENT CONTAMINATION.

5. STERILIZED INSTRUMENTS SHOULD BE USED.

6. UNIFORM SUSPENSION MAY BE OBTAINED BY SHAKING THE VACCINE.

7. THE RECOMMENDED DOSAGE SHOULD BE GIVEN.

8. NO ATTEMPT SHOULD BE MADE TO IMMUNIZE DISEASED OR UNHEALTHY ANIMALS.

9. INSTRUCTIONS SHOULD BE READ CAREFULLY.

KINDS OF INJECTIONS

1. PARAEXTERAL METHODS OF INJECTIONS - ANY METHOD OTHER THAN IN THE INTESTINAL TRACT.

2. CUTANEOUS - THE MATERIAL IS APPLIED TO THE SKIN OR RUBBED INTO THE SKIN.

3. INTRACUTANEOUS OR INTRADERMAL - INJECTED INTO THE SKIN

4. SUBCUTANEOUS - INJECTED JUST UNDER THE SKIN.

5. INTRAVENOUS - INJECTED INTO A VEIN WHEN FAST ACTION IS WANTED.

6. INTRAMUSCULAR - INJECTION IS MADE INTO LARGE MUSCLES. MUSCLES IN THE NECK AND THIGH ARE COMMONLY USED.

7. INTRACARDIAL - INJECTED DIRECTLY INTO THE HEART.

8. INTRATHORACIS - INJECTED INTO THE THORAX. NOT COMMONLY USED.

9. INTRAOCULAR - UNDER THE EYELID, INTO THE CORNEA, OR INTO THE ANTERIOR CHAMBER.

10. EPIDURAL - DIRECTLY INTO THE SPINAL CANAL.

11. INTRAPULMONARY - INJECTED INTO A LUNG.

12. INHALATION - VAPOR OR DUST IS INHALED.

13. ORAL - BY MOUTH OR INJECTED THROUGH A STOMACH TUBE.

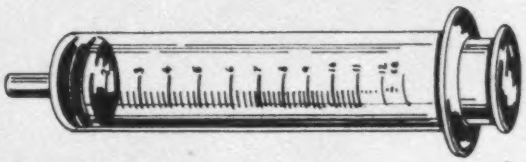
14. RECTAL (ENEMA) - INJECTED INTO THE RECTUM.

15. INTRAMAMMARY - INJECTED INTO MAMMARY GLAND.

16. SYRINGE - INSTRUMENT USED TO MAKE INJECTIONS, CONSISTING OF PLUNGER, BARREL, AND VARIOUS TYPES AND SIZES OF NEEDLES.

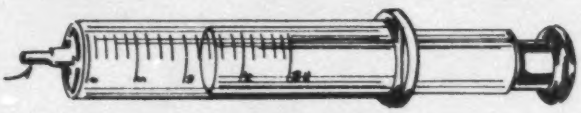
17. STOMACH TUBE - TUBE TO PASS MATERIALS DIRECTLY INTO THE STOMACH. MAY BE INSERTED THROUGH THE MOUTH OR NOSTRIL.

VACCINATING EQUIPMENT

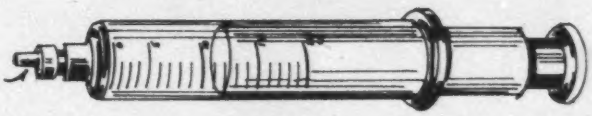


DISPOSABLE PLASTIC SYRINGE

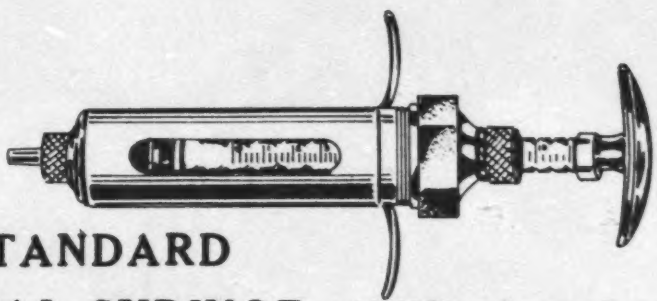
plain or metal tip



luer lock tip

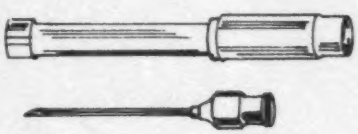


REUSABLE GLASS OR NYLON SYRINGES



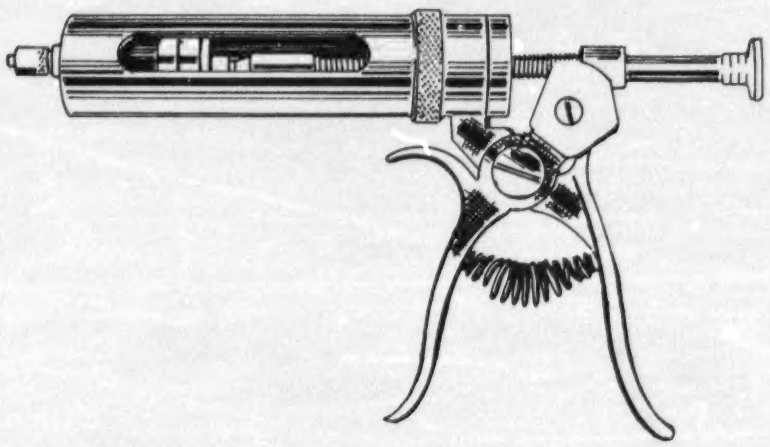
STANDARD METAL SYRINGE (with glass barrel)

REUSABLE STAINLESS NEEDLE

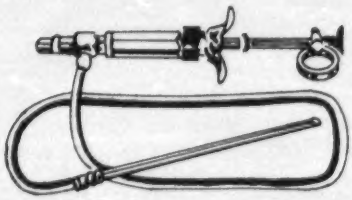


DISPOSABLE STERILE NEEDLE

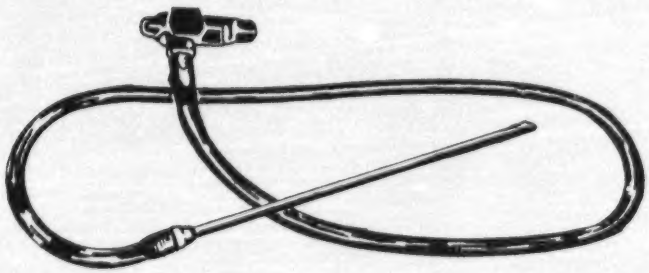
VACCINATING EQUIPMENT



AUTOMATIC REPEAT (PISTOL GRIP) SYRINGE

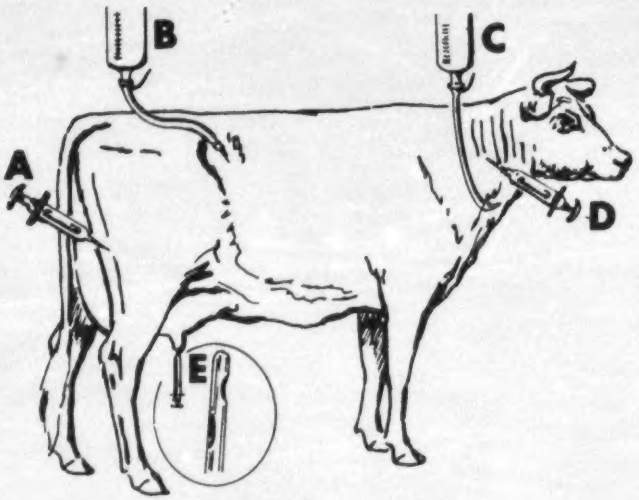


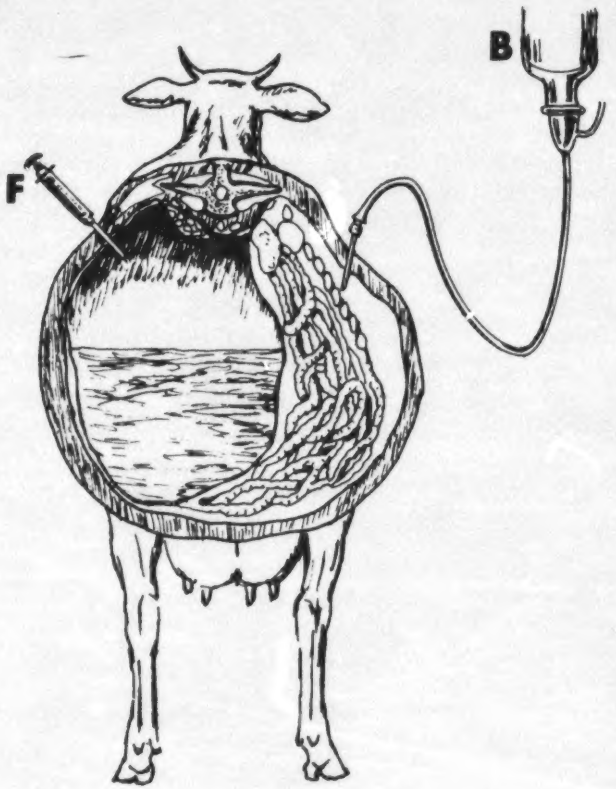
SELF-FILLING AUTOMATIC SYRINGE (PUMP TYPE)



SYRINGE FILLER ATTACHMENT

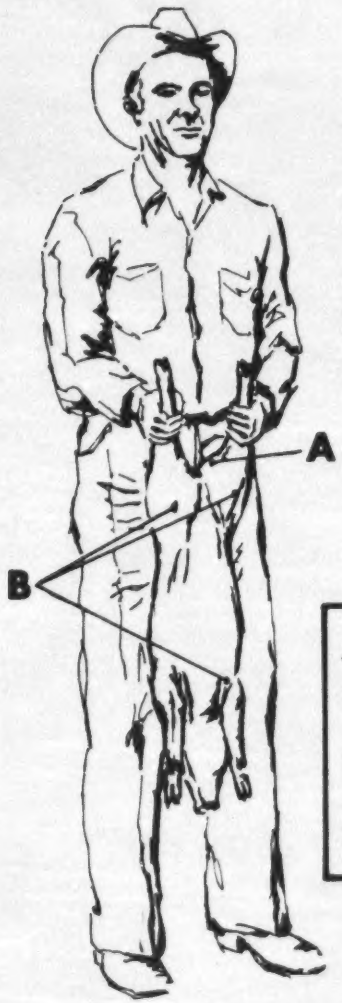
LOCATIONS AND TYPES OF HYPODERMIC INJECTIONS FOR CATTLE

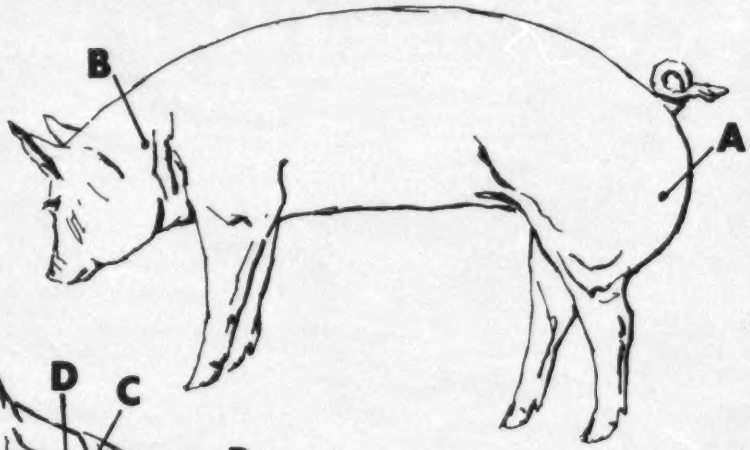


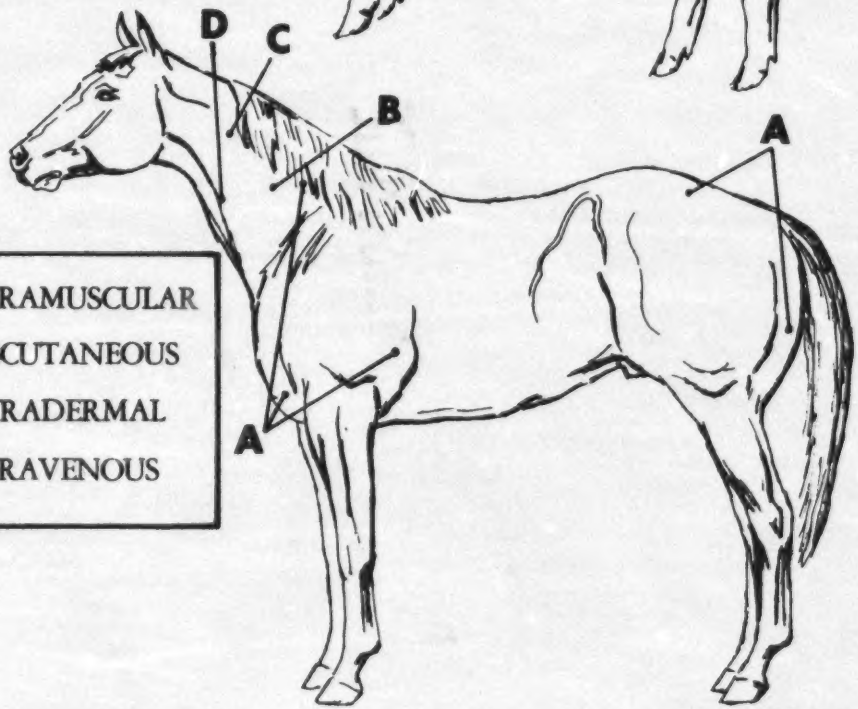


A INTRAMUSCULAR
B INTRAPERITONEAL
C INTRAVENOUS
D SUBCUTANEOUS
E INTRAMAMMARY
F INTRARUMENAL

LOCATIONS AND TYPES OF HYPODERMIC INJECTIONS FOR HORSES AND SWINE







A INTRAMUSCULAR
B SUBCUTANEOUS
C INTRADERMAL
D INTRAVENOUS

GLOSSARY OF TERMS

Adaptation—Adjustment to environmental conditions such as climate, biotic factors, etc.

American Standard of Perfection—A publication of The American Poultry Association containing a complete listing and description of all recognized varieties of fowls.

Artificial breeding—The depositing of the male semen in the female reproductive tract by artificial means.

Atrophy—Following the use of the elastrator for castration, the scrotum and testicles will decrease in size or finally wither away due to the blood supply being cut off.

Backfat probing—Taking a measurement of the fat thickness with a probing knife over the shoulder, over the last rib, and over the last lumbar (midway between the last rib and the base of the tail).

Balance—The skeletal and muscular make-up of a horse which determines his overall weight distribution and maneuverability.

Barrenness—The condition of a female animal that renders her sterile.

Blind teat—A teat on a sow that is not connected with the milk gland and will not produce milk.

Bloodline—The term as used in this unit refers to a family or family lines of breeding.

Boar—A mature, uncastrated male swine.

Braid—Coarsest grade of wool.

Breed of chickens—Chickens that are similar in body shape and form, and that are members of the same class.

Breeder cattle production—The production of breeding stock for purebred breeders and commercial cattle producers.

Broiler—A young chicken eight to ten weeks of age raised for meat production.

Broodmare—A female horse used for breeding purposes.

Buck—A mature, male goat or sheep.

Bull—The male of the bovine species (cattle).

Cabrito—The name given by Mexicans to the meat of a young Spanish goat.

Calves—Cattle under one year of age and of any sex.

Castrate—To remove the testicles of a male animal.

Certified boar—A boar that has sired several animals meeting the requirements for certification as established by a breed association.

Certified mating—The mating of a certified boar to a certified sow.

Certified meat litter—A litter of pigs meeting the production requirement as established by a breed association.

Certified sow—A sow that has met the production requirements as established by a breed association.

Chevron—The meat of an Angora goat.

Class of chickens—Refers to the area where the breed or variety of chicken was developed.

Cockerel—A male fowl less than one year of age.

Comb—The fleshy protuberance growing on top of a fowl's head.

Commercial—A non-purebred animal.

Commercial cow-calf producer—A stockman producing animals from a non-registered herd.

Commercial herd—A herd of animals used to produce animals which will eventually be slaughtered for meat.

Constitution—A judging term used to describe structure or physical make-up of the animal.

Cows—Female cattle that show evidence of having produced one or more calves.

Crimp—The characteristic form or succession of waves in wool fibers; a desirable crimp is close and distinct.

Crossbred—An animal resulting from the mating of two different breeds.

Crossbred breeder—A breeder of livestock producing animals that are of the offspring of animals of two different breeds.

Crossbreeding—The breeding of animals of two different breeds.

Creep feeding—The supplementary feeding of young animals while nursing.

Cut-up—A high-flanked animal usually slight in body capacity; also referred to as wasp-waisted.

Dairy cattle pedigree terms and abbreviations:

2X - 305 Days—Milked twice a day for 305 days; the records on most pedigrees are adjusted to 2X - 305 days mature equivalent basis (M. E.).
#M—Pounds of milk
% B. F.—Percent of butterfat
Rec.—Record(s)
#F—Pounds of butterfat
Av.—Average
Daus.—Daughters

Disposition—The temperamental make-up of an animal.

Diversified—The production of several different kinds or classes of livestock.

Docile temperament—Easily managed disposition.

Doe (goat)—A female Angora or Spanish goat.

Doe (rabbit)—A female rabbit.

Dominant—Controlling or prevailing over all others; thus, certain genetic traits exert an influence over other traits for similar characteristics in animal breeding.

Double muscling—An abnormal condition in some beef animals where muscle cells multiply or increase out of proportion to normal cells giving the individual excessive muscle development.

Down breeds—The Hampshire, Suffolk, Southdown, Shropshire, and Oxford are collectively referred to as "down" breeds, because they were developed in the downs or range of hills in southern England.

Draft animal—Animal used for work stock and, in some countries, is still used for plowing and pulling heavy loads.

Dual-purpose breed—A breed that is recognized for the production of more than one marketable product; sheep for both mutton and wool production and cattle for both meat and milk production.

Early speed—Ability of a horse to obtain his maximum speed in one or two strides.

Easter lamb—A lamb that is raised and sold on the Easter market.

Environment—The complex of climatic and biotic factors that act upon an organism to determine its form and survival (example—management, climatic factors, nutrition, etc.)

Equine—The horse family.

Ewe—A female sheep.

Exotic breeds—The new European breeds and others which are currently being imported into the U.S.

F_1 females—Female cattle from the first cross of mating of two different purebreeds of cattle.

Fall lamb—A lamb that is usually born in the spring and sold in the fall.

Feeder production—The production of cattle for feeders; feeder cattle do not carry enough finish to make the slaughter grades.

Feeders—Animals which have been grown out to a determined size or weight and are ready to be placed in the feedlot for finishing to a determined grade.

Fertility—Capable of breeding or reproducing.

Flat boned—Reference made to the cannon bone region of a horse's leg, which is constituted by the bone, ligaments, and tendons.

Fryer—A young, immature bird (turkey or chicken) that is tender meated and has soft, pliable, smooth-textured skin and flexible breastbone cartilage.

"Full bloods"—A term used by some people when referring to purebred animals.

Functional efficiency—In cattle, the production of as much good red meat per unit area as possible. In its broadest sense: fertility, genetic excellence, libido, ability to copulate, estrus, ovulation, fertilization, embryo survival, gestation, parturition, and mothering ability of the cow.

Gaited—Definite rhythmic movement of a horse such as trot, canter, pace, etc.; certain breeds are selected and bred on the basis of their ability to perform the various gaits.

Gather—Horseman's term for collection in an animal.

Gelding—A castrated, male horse.

Get—The offspring of an animal, usually the sire.

Gilt—A young, female swine that has not reproduced.

Goslings—The term applied to baby geese soon after hatching.

Hand—The height of a horse. The measurement is taken from the top of the withers to the ground; a hand is four inches.

Heat tolerant—Ability of the animal to endure extreme heat conditions.

Heifer—A female bovine which has not borne an offspring.

Heiferette—A cow that has produced an offspring but has retained the appearance of a heifer.

Hen—A mature, female chicken.

Herd classification—Based on score given animal by official classification:

EX—Excellent	90-100
VG—Very good	85- 89
GP—Good plus	80- 84
G—Good	75- 79
F—Fair	65- 74
P—Poor	64 and below

Hereditary—The qualities or potentialities genetically derived from one's ancestors.

Heritability percent estimates—The percent of a trait which isn't affected by environment that is inherited from an animal's parents.

Heterosis—An obvious vigor or capacity for growth often shown by crossbred animals.

Homogenization—A mechanical process of distributing fat throughout milk and other dairy products.

Homozygous recessive—Possessing an identical pair of genes for a characteristic that does not exert a controlling influence.

Horned—Cattle that have horns carry the horned trait as a homozygous (pure) recessive condition.

Hothouse lambs—Lambs that are born in the fall or early winter, are finished for market when they are 6 to 12 weeks old, and weigh from 30 to 60 pounds.

Hybrid—An animal produced from the crossing or mating of two animals of different breeds.

Hybrid vigor—Vigor usually possessed by hybrid animals.

Inbreds—Swine breeds which have been developed by inbreeding some of the chosen crossbred lines.

Kid—A young goat under one year of age.

Litter—The offspring at one birth of a multiparous animal; example—swine.

Longevity—Length of life; a long duration of life.

Mare—A female horse.

Meat-type hog—A well muscled hog that has good length of body and an above average percentage of ham, loin, and shoulder.

Mutton—A sheep or goat over one year of age that was castrated while a lamb.

Nick or nicking—A term used by livestock men when the offspring in general is better than its parents.

Overo—Basically white in color and the spotting is usually roan and extends upwards from the belly. The darker areas are usually small or rather ragged patches; the mane and tail are usually a mixture of color giving a roan effect. Overo horses usually have bald faces, and glass eyes are not uncommon.

Old-crop lambs—Sheep over one year of age that have lamb teeth.

Pasteurization—The heating of milk to destroy the bacteria in milk and all disease producing bacteria.

Pedigree—A table presenting a line of ancestors for an animal.

Pelts—Undressed skin or hide with its hair, wool, or fur; example—rabbit pelt.

Performance record—The evaluation of an animal's production based on several factors; factors may be number of calves weaned, birth weight, weaning weight, etc.

Plumage—The feathers of a fowl.

Polled—Naturally hornless; the polled trait is dominant over the horned trait.

Poult—A young turkey; a turkey from one day of age until it reaches maturity.

Prepotency—The ability to transmit characteristics to offspring to an unusual degree.

Primal cuts—The most valuable wholesale meat cuts; the primal cuts of a pork carcass are the ham, loin, Boston butt, and the picnic.

Production record—A record of an animal's production.

Production Registry—Hogs meeting certain production requirements as established by a swine breed association.

Productive capacity—Ability and performance of a given animal to produce a marketable product.

Prolific—Productive; abundant reproduction; a prolific ewe will produce offspring (often twins) at reasonable intervals.

Pullet—A female chicken less than one year of age.

Purebred—An animal, which may or may not be registered, that is of a recognized breed which has been kept pure many generations.

Purebred breeder—A breeder of animals, which may or may not be pedigreed.

Registered animal—A purebred animal for which a registration certificate and number have been issued by a breed association.

Registered breeder—A breeder of registered purebred cattle.

Rudimentaries (teats)—The teats on a boar.

Scurs—Small, loosely attached horns that sometimes appear on polled animals.

Semen—A fluid consisting of spermatozoa and carrier liquids produced by male animals; it is necessary that semen be placed in the female reproductive tract for conception to occur.

Sexed chickens—Chicks that have been separated according to sex at hatching.

Sheep in-the-wool—Unshorn or unclipped sheep.

Slaughter cattle production—The production of cattle for slaughter.

Sour—Term used to denote a horse that has been overworked or trained to the point that he refuses to perform.

Sow—A mature, female swine that has produced a litter of pigs.

Spanish goat—A goat brought to this country by the Spanish explorers; it was used for milk and meat.

Spring lamb—A lamb that is marketed in the spring of the year and prior to July 1; they are usually born in the fall.

Splayed—A common fault found in horses which means that the front hooves are turned out and the heels turned in.

Splints—Abnormal bony growth found on the cannon bone of some horses.

Stag—A male animal that was castrated after it reached sexual maturity (horses excluded).

Stallion—A male horse.

Standard breeds—The traditional and newly established beef breeds used by cattlemen in the breeding programs in the U.S.

Steer—A male bovine animal that was castrated before reaching sexual maturity.

Sterility—The inability of a male animal to reproduce.

Stock horse type—Horses of the Quarter, Paint, and Appaloosa breeds, mainly thoroughbred and Arabian; bred for early speed, agility, disposition, and intelligence.

Straight-run chickens—Chicks of both sexes in the order in which they hatch; chicks hatch in about equal numbers of both sexes.

Strain of chickens—A family name used to designate the breeder.

Substance of bone—A judging term used to describe the form or structure of the bone or skeletal framework.

Supplement—Additional feed given to animals.

Teat placement—The placement of teats on a sow's underline; they should be evenly spaced.

Tobiano—Basically, a white horse in which large, smooth, and solid blocks of color originate on the back and rump and extend down. The face is usually marked the same as in other color patterns found in horses.

Tracks—A term used to describe the leg movements of a horse while he is walking.

Tri-purpose animal—Animal that has been developed and used for draft (work) purposes as well as for meat and milk production.

Turkey hen—A mature, female turkey.

Turkey tom—A mature, male turkey.

Two-year olds—Cattle that are two years old.

Utility—Usefulness.

Variety of chickens—This is a subdivision of the breed of chickens and is determined by plumage color and the comb.

"V" muscle—The muscles of the chest of a horse which give the appearance of an inverted "V."

Wether—A castrated male lamb under one year of age.

Wintered—A term used to describe the way an animal was fed through the winter season.

Wool production—The production of sheep with the primary purpose being for the marketing of the fleece of wool clip.

Yearlings—Cattle between one and two years of age.